

Research Report
Research Project T1803, Task 37
Service Patrol

**EVALUATION OF THE SERVICE PATROL PROGRAM
IN THE PUGET SOUND REGION**

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CHAPTER 1 INTRODUCTION

In 1998, the Service Patrol Study Steering Committee, which was initiated by the Washington State Legislative Transportation Committee (LTC) and formed in 1997, promoted the provision of additional towing services to improve incident removal from the most congested sections of Puget Sound area freeways. The primary goal of a Service Patrol is to provide quick response to incidents and clear roadways as rapidly as possible in high volume areas during peak traffic times. The Service Patrol Study Steering Committee, comprising representatives from the Washington State Department of Transportation (WSDOT), Washington State Patrol (WSP), Washington Insurance Council, and Washington State Tow Truck Association (WTTA), reviewed current incident response services, relevant statistical history, and similar past programs in the Puget Sound and in other major metropolitan cities. This review revealed that Service Patrols around the country had been estimated to produce benefit to cost ratios that ranged from 7:1 to 36:1.¹ A recent WSDOT Incident Response Team (IRT) program evaluation showed an estimated benefit to cost ratio of between 4:1 and 13:1.² Another evaluation of Service Patrols operated by the WSP and WTTA in the Puget Sound area for two weeks during the 1990 Goodwill Games indicated that quick response operations were effective at reducing response and clearance times and received positive public feedback.³ On the basis of the gathered information, the committee recommended the deployment of roving Service Patrols to allow a qualified service provider to rapidly

¹ Morris, M., and W. Lee. *Survey of Efforts to Evaluate Freeway Service Patrol*, Transportation Research Record 1446, TRB, National Research Council, Washington, D.C., 1994.

² Nam, Doohee, Fred L. Mannering, Jodi L. Carson, and Jennifer Nee, *Washington's Incident Response Team Program Evaluation*. Washington State Department of Transportation, May 1997.

³ Mannering, Fred L. and Mark Hallenbeck, *Incident Management Systems Framework – Impacts of Service Patrol*, Washington State Department of Transportation, March 1991.

respond to disabled vehicles, remove them and their occupants to a safe area, remove minor debris, and resolve other problems.⁴ The committee also recommended an evaluation to determine and compare the effectiveness of the service modes, namely, the WSP cadets, contracted tow operators, WSDOT tow trucks operated on the floating bridges, and privately sponsored motor assistance vehicles such as that of the American Auto Association (AAA).

REPORT PURPOSE

The purpose of this report is to examine different methods of service delivery and to provide lessons learned for future implementation. The findings from the evaluation are intended to inform future decisions about continued service.

The evaluation examines how the similarities and differences among the different service delivery modes (e.g., the intensity of deployment, equipment choices, service delivery, costs) affect the impact of the Service Patrol operation on traffic conditions (e.g., reductions in delay) and the level of motorist satisfaction. This report also discusses feedback by the agencies participating in the Service Patrol program on institutional and operational issues that contribute to or hinder the success of the program. Operational characteristics and operating statistics are reported to convey factors that describe program effectiveness. Finally, public opinions about the quality of service and the desirability of the program are presented.

SERVICE PATROL PILOT IMPLEMENTATION

Project Partners

The Service Patrol pilot demonstration involved both public/public and public/private partnerships. The freeway patrol service was managed by the WSDOT

⁴ *Service Patrol Study – Greater Puget Sound Freeway System*, Washington State Department of Transportation, Report to the Legislative Transportation Committee, January 14, 1998.

and operated by

- Washington State Patrol cadets
- contracted registered tow truck operators (RTTOs).

Two other roving services, not funded as part of this pilot effort but included to a limited extent in this evaluation, were the roving patrol service provided by WSDOT on the SR 520 and I-90 floating bridges and the privately sponsored motor assistance vehicle from AAA's RescueVan. A list of representatives from the WSDOT, WSP, WTTA, participating RTTOs, and AAA is provided in Appendix A.

Resources

The pilot program was funded with state dollars. The \$600,000 Pilot spending plan distributed \$174,000 for WSP cadets and \$370,000 for RTTOs. In addition to these direct expenses, WSDOT spent about \$16,000 of the pilot project funding to manage the RTTO contracts and to provide training and materials for both the RTTO and WSP efforts. In addition, \$40,000 of the \$600,000 pilot funding was dedicated to the evaluation effort.

Pilot Implementation

Figure 1-1 shows the service coverage provided by various service delivery modes. The Service Patrol funded by the pilot program continuously patrolled designated segments of highway during peak commute hours on weekdays from 6:00 AM to 10:00 AM and from 2:00 PM to 6:00 PM.

- WSP Cadet Patrols

Segments of the freeway patrolled by WSP cadets included northbound and southbound I-5 from Roanoke Street to 145th Street in Seattle, including all ramps, the express lanes, and collector/distributor roadways. In Tacoma, cadets patrolled westbound and eastbound SR 16, from the I-5 Interchange to Olympic Drive, including all ramps and collector/distributor roadways.

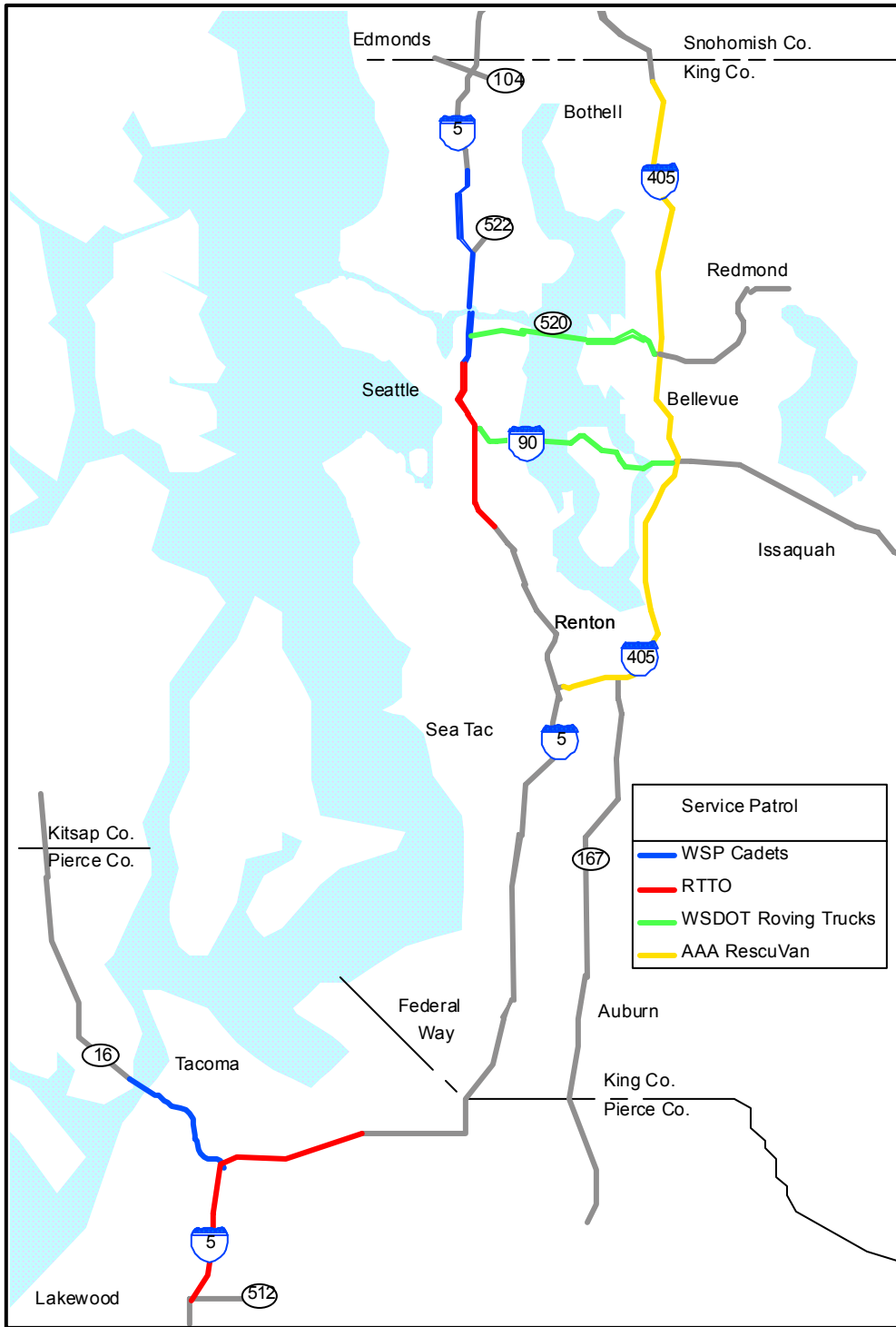


Figure 1-1. Service Patrol Coverage

- Roving Tow Truck Patrols

Service Patrols operated by private contract towers were available in Seattle on I-5 between Corson-Michigan Street and Mercer Street. In Tacoma, they operated on I-5 between 38th Street and the Port of Tacoma Road in the morning, and in the afternoon between the SR 16 Interchange and the SR 512 Interchange.

The roving patrol service provided by the WSDOT on the SR 520 and I-90 floating bridges had a slightly different service schedule. The service hours were primarily during 5:30 AM and 9:30 AM and 1:30 PM and 6:30 PM. The AAA RescueVan patrolling between NE 195th and Renton on I-405 operated from 6:00 AM to 9:00 AM and from 3:30 PM to 7:00 PM.

Roles and Responsibilities

Puget Sound area Service Patrols locate, assist, and/or relocate a disabled vehicle in the traffic lane and/or shoulder on designated highway segments, as well as assist local public agencies or law enforcement authorities, as requested, with an accident or other emergency. Simple assistance, such as changing a tire, providing a jump start, or supplying fuel to “out-of-gas” vehicles, may be rendered on the highway shoulder. Otherwise, the Service Patrol will relocate the vehicle from the highway to the end of a ramp or to a nearby dedicated drop area. Once a vehicle is at a safe location clear of the roadway, motorists may request a tow—at their expense—or make their own arrangements for removal of their vehicle.

Training

A training session, jointly provided by the WSDOT, WSP, and WTTA, was provided for the RTTOs. The topics included the following:

- First aid – by the WSDOT Safety Office
- Awareness of HazMat – by the WSP Fire Protection Bureau

- Standard operating procedures (e.g., vehicle inspection, responsibility for service) – by a WSDOT operations supervisor
- Radio communications – by a WSP Communications Supervisor
- Tow truck operations – by WTTA trainers

The purpose of the training was to make sure all respondents understood their roles and responsibilities in keeping the traffic flowing while recognizing that safety was most important. Emphases included communication flow during operation for timely notification and response, as well as the importance of teamwork among the emergency responders.

WSP cadets were trained separately in-house to become Service Patrols because they would not operate tow-equipped vehicles. However, WSP cadets could attend portions of the training along with the RTTOs to ensure adequate coordination and mutual understanding of operating procedures. WSDOT's truck operators were also trained in-house for other WSDOT maintenance and emergency duties and traffic control. AAA's RescueVan was trained by its staff to perform minor vehicle maintenance.

Project Management

The project was managed by the WSDOT, with close interaction with each of the project stakeholders. Regular project status and coordination meetings were conducted to enhance coordination and understanding of project development among project partners (e.g., representatives from WSDOT, WSP, WTTA, participating RTTOs, and the independent evaluation team from the University of Washington). This mechanism provided an opportunity for project members to understand the project status, discuss problems encountered, and help steer the project in the right direction.

Public Relations

A media launch was held to kick off the pilot program. The program was covered by several local television stations (e.g., KOMO, King5 News, KIRO TV, Q13) and

newspapers. The WSDOT also prepared a follow-up release to the media about the progress of the program. In addition, an information brochure regarding the purpose and the operation of the Service Patrol was prepared (see Appendix B).

Related Efforts

Concurrent efforts included the following:

- ***WSDOT On-line Freeway Cameras and Traffic Flow Maps*** — Additional cameras have been installed in the Puget Sound area.
- ***WSDOT Incident Response Teams*** — IRTs provide 24-hour, on-call traffic control support to the WSP for major road-blocking incidents in the Northwest, Olympic, Southwest, and Eastern regions.
- ***WSDOT Tow Truck Service Patrol on Lake Washington*** — Tow trucks patrol the floating bridges on SR 520 and I-90 during peak commute periods.
- ***Freeway Signage*** — Increased numbers of “No Parking/Tow-Away Zone” signs have been installed along key stretches of I-5, I-405, and SR 520.
- ***Interagency Agreement*** — An “open roads” Memorandum of Understanding has been signed between WSP and WSDOT that directs both agencies to open roadways that become closed or blocked by incidents as soon as possible.

REPORT ORGANIZATION

The intent of this report is to describe the costs and benefits of these services, and to compare the relative merits of these different approaches. The results are documented in the following manner:

- Chapter 2 - a description of the research approach followed for this project
- Chapter 3 - a description of incident characteristics and operating statistics
- Chapter 4 – a comparison of the service delivery modes
- Chapter 5 – implementation issues
- Chapter 6 – conclusions and recommendations

CHAPTER 2 RESEARCH APPROACH

The focus of the evaluation was on the effectiveness of each service delivery mode in comparison to the others in helping reduce delays and providing customer service. The evaluation was not designed to quantify the Service Patrol's overall benefits or justify the program. Given the scope of the project, the evaluation efforts focused on the following tasks:

- conducting an analysis of the incident data to describe Patrol services operated by various modes
- comparing the services provided, program impacts, and operational cost for the tested service delivery modes
- determining institutional, operational, and technical issues.

ANALYSIS OF INCIDENT DATA

The data compiled during the first six months of operation (August 2000 to January 2001) formed the basis for reporting the operational statistics. The types of incident data included the following:

- number of motorist contacts
- distribution by time
- distribution by location
- method of detection and notification
- frequency of false alarms
- type of incidents
- lane blockage
- response time.

The operational statistics were obtained from information recorded in the Service Patrol logs. Service Patrols were required to fill out an assist form for each contact made. The

forms included the location of the incident, various time stamps, the cause and problem associated with the incident, and the actions taken. A copy of the assist form is included in Appendix C. The information on hard copy was then hand-coded into a spreadsheet computer program for compilation and analysis. Other secondary data resources included the WSDOT's FLOW system and Transportation Data office for vehicle volume data. Vehicle volumes were also used for computing benefits. For the Seattle area, complete volume data were readily available from the FLOW system. Partial data for the Tacoma area were available and provided by the WSDOT's Transportation Data Office.

COMPARISON OF SERVICE DELIVERY MODES

Comparison of service delivery mode factors such as service areas, service hours, training, and service delivery was accomplished on the basis of the information gathered from observing the pilot operations. The evaluation also assessed program impacts such as quantified and perceived benefits resulting from each service mode and associated operation costs.

Quantifying Benefit

Response time was compared between incidents before and after the Service Patrol operation. The *before* data were extracted from the WSP's Computer Aided Dispatch (CAD) system and filtered through several steps to obtain response times that were directly associated with the Service Patrol:

- dates (e.g., August 1999 to January 2000, 1999)
- patrolled segments
- time (weekdays, 6:00 AM to 10:00 AM and 2:00 PM to 6:00 PM)
- blocking incidents involving disabled vehicles, collision, or debris.

The *after* data were obtained from the Service Patrol logs. In general, the correlation between the assist forms and the CAD data was reasonably good. The intent of this check was to make sure that it would be reasonable to directly compare time stamps from

the two sources.

The approach was based on the assumption that the tangible benefits would primarily stem from a shortened response time (that is, from the time when an incident was detected to the time when the first responder arrived at the scene). In this case, incident response time was defined as the duration from the time the Service Patrol received information about the incident, either by themselves or via WSP's radio broadcast, until the Service Patrol arrived at the scene. Service Patrol would arrive and respond to an incident as quickly as possible in the chain of incident management and perform their duties when feasible. Thus, the methodology for quantifying traffic benefits involved the following:

- Identify the change in incident response time This was calculated by comparing CAD data collected before implementation of the Service Patrol with data collected about lane blocking incidents to which the Service Patrol responded.
- Determine the change in vehicle hours of delay The change in vehicle hours of delay during the incident response phase was estimated on the basis of queueing theory using traffic volumes on the roadway. Assuming one-lane blockage, appropriate traffic flow reduction was applied on the basis of literature cited in "Relieving Traffic Congestion Through Incident Management 1994" (e.g., 33 percent reduction for a four-lane facility, 50 percent reduction for a three-lane facility, 70 percent reduction for a two-lane facility).
- Estimate the value of time An average person-hour of \$12.40 was used to compute delay savings on the basis of the Texas Transportation Institute's 2001 Urban Mobility Study.
- Compute the cost of delay savings $\text{Delay savings} = [\text{Change in delay (veh-hr per incident)}] \times [\text{number of incidents}] \times [1.2 \text{ person per veh}] \times [\$12.40 \text{ per person-hour}]$

The limitations of the quantitative approach should be recognized. Attempts were made to quantify the Service Patrol's contribution in reducing total incident duration.

However, the indication of incident clearance time found in data sources such as CAD and Service Patrol logs reflected inappropriate durations and inconsistent definitions of incident clearance time. For example, for an incident involving a collision, the Service Patrol might not be needed for the entire duration and might leave after the roadway had been cleared but before the WSP officer was done with the investigation. Because the total duration should include the time from incident occurrence until the last response unit departs from the scene, the clearance time stamp in the CAD log may indicate the last unit's departure time or the time that the dispatcher closes the particular case, knowing that the roadway may have been cleared and traffic back to normal flow much earlier in the process. In addition, the duration of clearance time is affected by other variables, such as the time required for a WSP officer to investigate the incident, time to clear special debris, time to wait for an additional tow if it is required for different types of incidents, and the time when the last responding unit calls in.

Identifying Perceived Benefits

In addition to traffic impacts, some other intangible benefits such as customer satisfaction were important in describing the program's effectiveness, although they were not possible to quantify. Customer satisfaction was obtained through motorist surveys. Motorists who received services from the Service Patrol were asked to rate the service in a survey. The evaluation also focused on whether motorists' attitudes changed with different modes of service. In addition, the survey assessed public awareness of the program. Finally, motorists were asked to offer their comments about the program. A copy of the public survey card is in Appendix C.

The evaluation also assessed the perceived benefits received by the responding agencies. Feedback on organizational/institutional and operational issues were solicited from the project partners. The intent was to obtain their point of view about how the agencies benefited from the Service Patrol program.

Conducting a Cost Analysis

An hourly rate, including labor cost, vehicle cost, and overhead, was obtained for the Service Patrol operated by the WSDOT and the WSP. The cost of the RTTOs was based on the negotiated contract hourly rate, which included their operator and vehicle costs, plus profit and overhead. The hourly rate for AAA's RescueVan operation was based on AAA's annual budget estimates.

DETERMINATION OF IMPLEMENTATION ISSUES

Feedback on institutional, operational, and technical issues was solicited from the project partners. Another information source was the project meetings, where issues were presented and discussed.

CHAPTER 3 OPERATIONAL CHARACTERISTICS

Characteristics of the incidents, such as incident type and the level of service provided by the Service Patrol, were analyzed.

NUMBER OF MOTORIST CONTACTS

During the six-month period, over 5,000 Service Patrol assists or contacts occurred on the patrolled segments on I-5, I-405, SR 16, and the floating bridges on I-90 and SR 520 (see Figure 3-1a). Note that the frequency of Service Patrol contacts varied depending on the traffic volumes and the roadway configurations, as well as the length of the segments and the number of on-site patrolling units. Notice that the personnel supplied by the WSP and RTTO were two operators per shift in the Seattle area; the Tacoma area had only one patrol from each agency at a time. Three WSDOT trucks were provided for the floating bridges. The AAA had just one passenger van. On a per patrol unit basis, Figure 3-1b shows that both cadets and the RTTOs responded to approximately the same number of contacts. Fewer contacts were made by the WSDOT's trucks and AAA's RescueVan. Note that the AAA's RescueVan was available only during the afternoon service hours but not during the morning service hours in September and October of 2000.

A rough estimate based on a one-week sample in August 2000 indicated that the Service Patrol responded to a significant portion of the incidents, such as disablements, debris, abandoned vehicles, and collisions, that occurred on the patrolled segments during the service hours (see Table 3-1). The remaining incidents were handled by regular WSP officers and the Incident Response Team. In Seattle and Tacoma, both cadets and RTTOs responded to roughly the same number of incidents. However, on some roadway segments, the percentage of total incidents was smaller than on other segments.

**August 2000 - January 2001
6-10AM, 2-6PM**

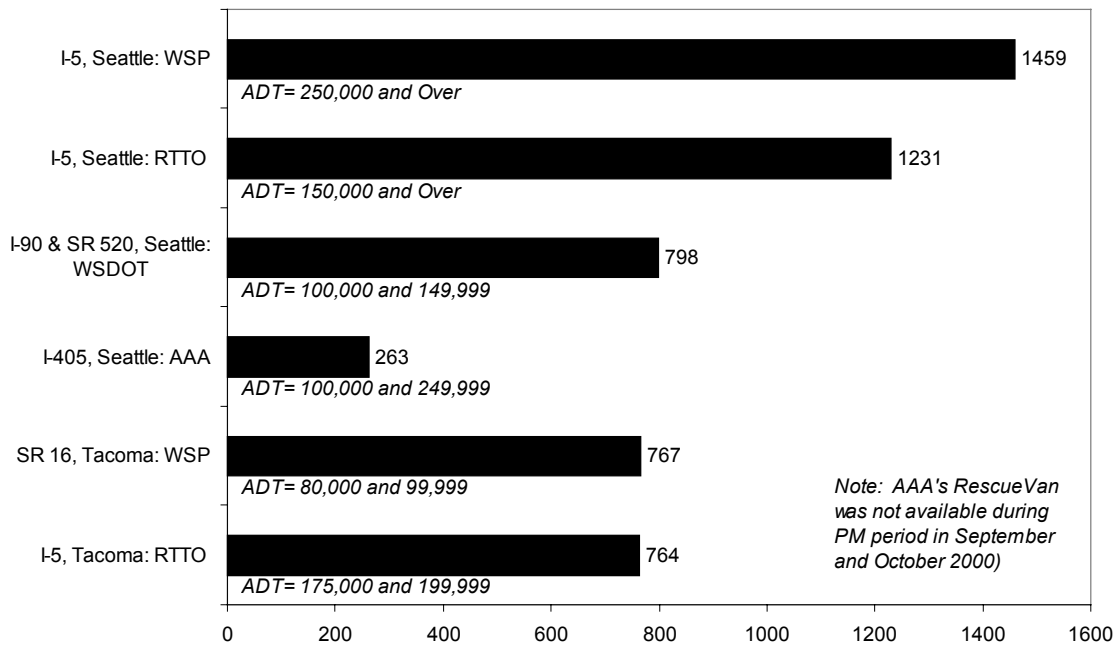


Figure 3-1a. Motorist Contacts by Location and Mode

**August 2000 - January 2001
6-10AM, 2-6PM**

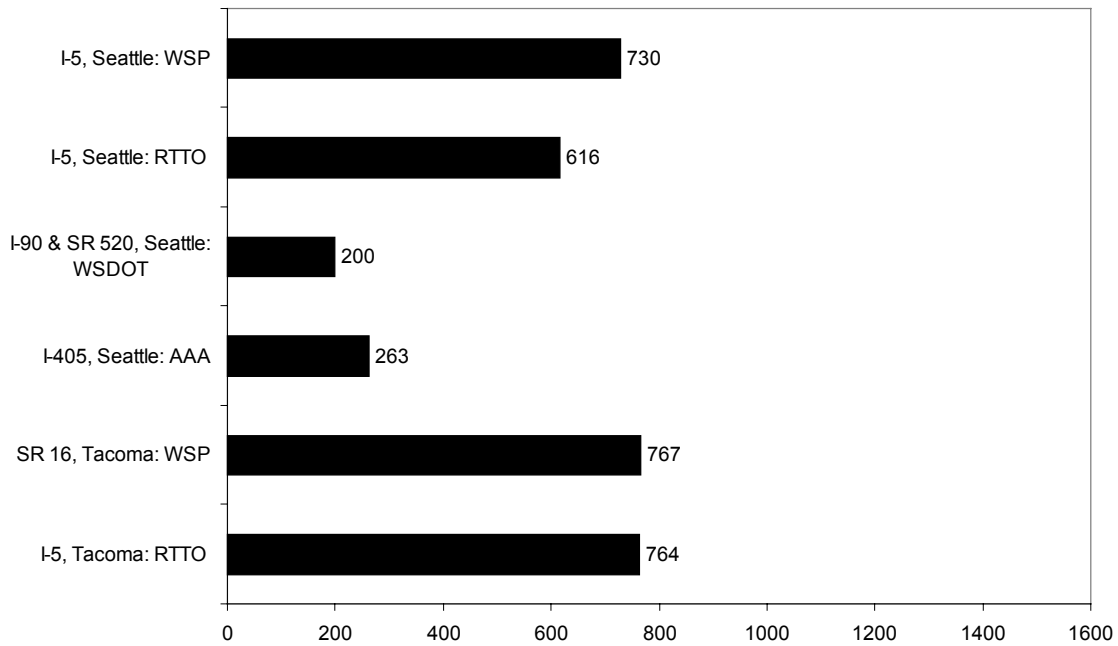


Figure 3-1b. Motorist Contacts Per Patrol Unit

Table 3-1. Level of Incident Response by Service Patrol (8/21/00-8/25/00)

Agency	Total Incidents Recorded on the CAD System	Responded to by Service Patrol	Percentage
I-5 Seattle WSP Cadets	87	41	47%
I-5 Seattle RTTO	66	45	68%
SR 16 Tacoma WSP Cadets	48	29	60%
I-5 Tacoma RTTO	60	25	42%

Distribution by Time

Figure 3-2 shows the number of contacts by month. In general, more contacts were made during the summer and fall than during the winter. The pattern of contact frequency was similar to that of monthly traffic volumes (see figures 3-3a to 3-3c). In the Seattle area, both the number of contacts and the traffic volumes were relatively higher in August and September than in November and December. (Note that information on monthly traffic volume variation for I-5 and SR 16 in Tacoma was not readily available.)

More motorist contacts occurred during the afternoon commute hours than in the morning. The pattern was relatively similar for all the service areas; about 60 percent of the motorist contacts were in the afternoon service hours. Figures 3-4a to 3-4f illustrate the distribution of contacts in relation to the average hourly volume in 2000 for each location and mode. (Limited volume data were available for the Tacoma area.)

Distribution by Location

Figures 3-5a to 3-5g illustrate the number of motorist contacts by location along a specific coverage area. Some patrol segments experienced groupings of contacts within each patrol area. For instance, on I-5 north of the Seattle downtown, most contacts occurred between Mercer St. and the University District and between NE 85th St and NE 145th St. Contacts occur frequently at three major spots near the Seattle downtown area:

near James and Columbia, the I-90 Interchange, and near the West Seattle Freeway and Michigan St. On the I-90 floating bridge, more contacts were found in areas near the Mt. Baker Tunnel, the mid span of the bridge, and Island Crest Way. On the SR 520 floating bridge, the incident occurrences spread relatively evenly between Medina and the Portage Bay viaduct. AAA's RescueVan had more contacts near the SR 520 interchange on I-405. In Tacoma, contacts were made relatively evenly over the SR 16 segment from the I-5 Interchange to the west side of the Narrows Bridge. On I-5 in Tacoma, a concentration of contacts was found near the SR 16 Interchange.

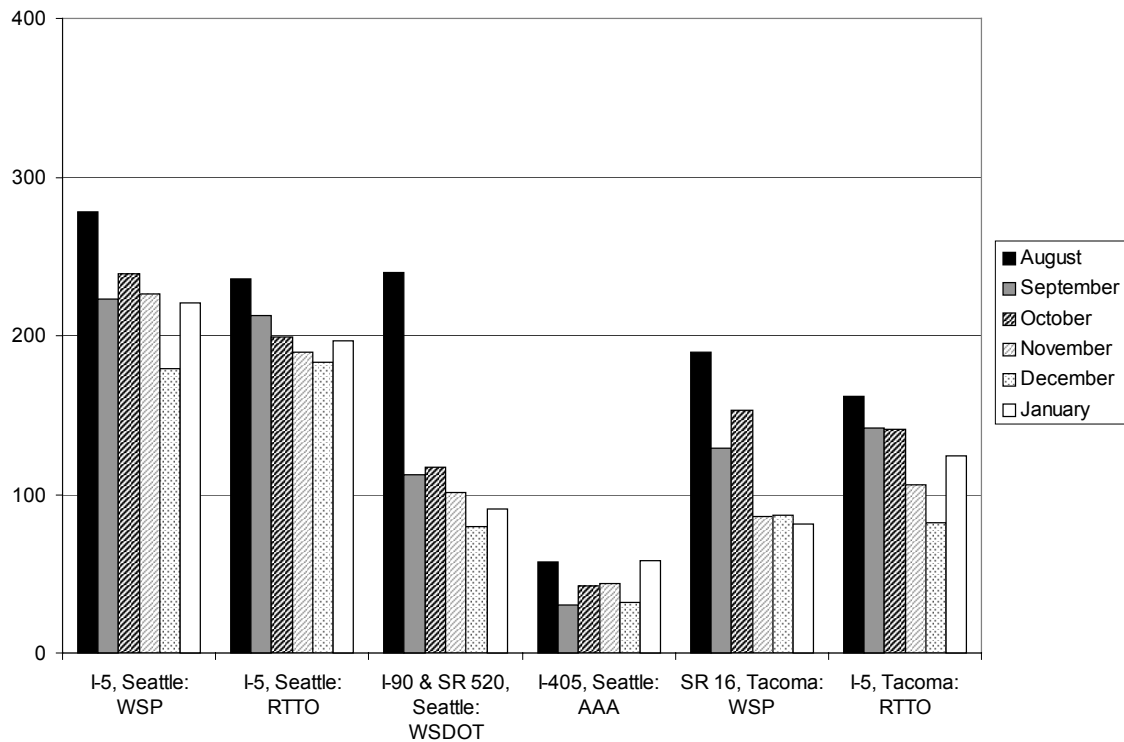


Figure 3-2. Distribution of Contacts by Month

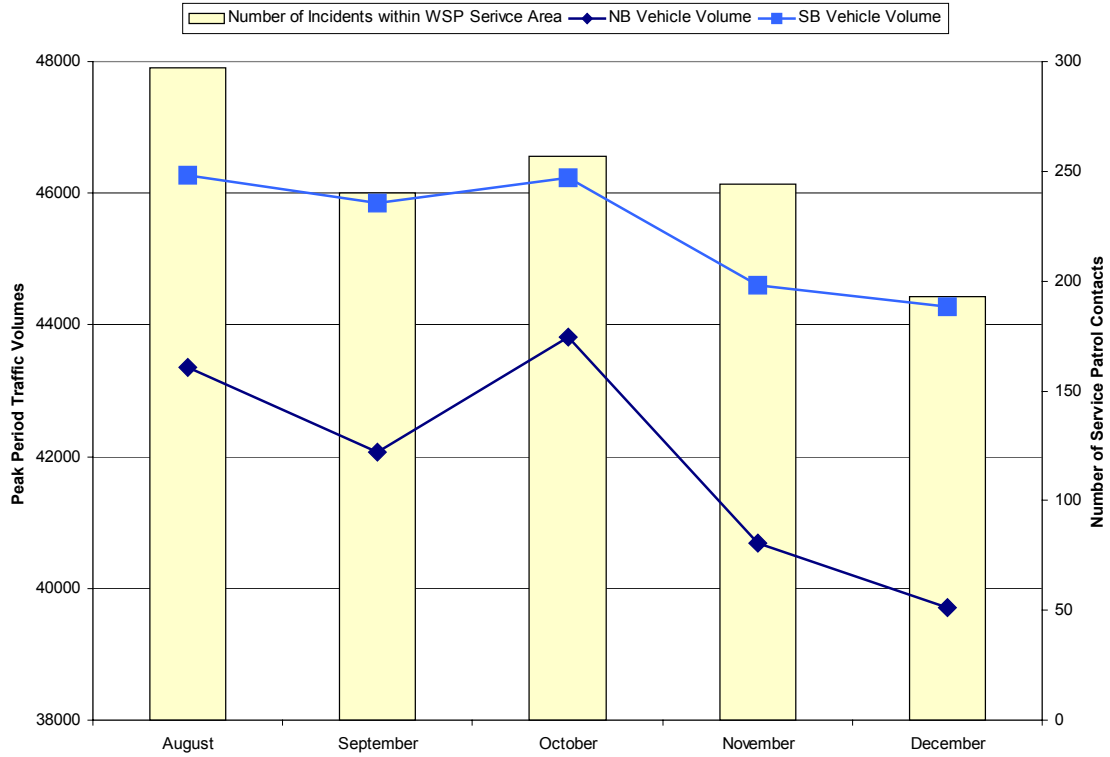


Figure 3-3a. Contacts vs. Monthly Traffic Volumes at Ship Canal Bridge, I-5

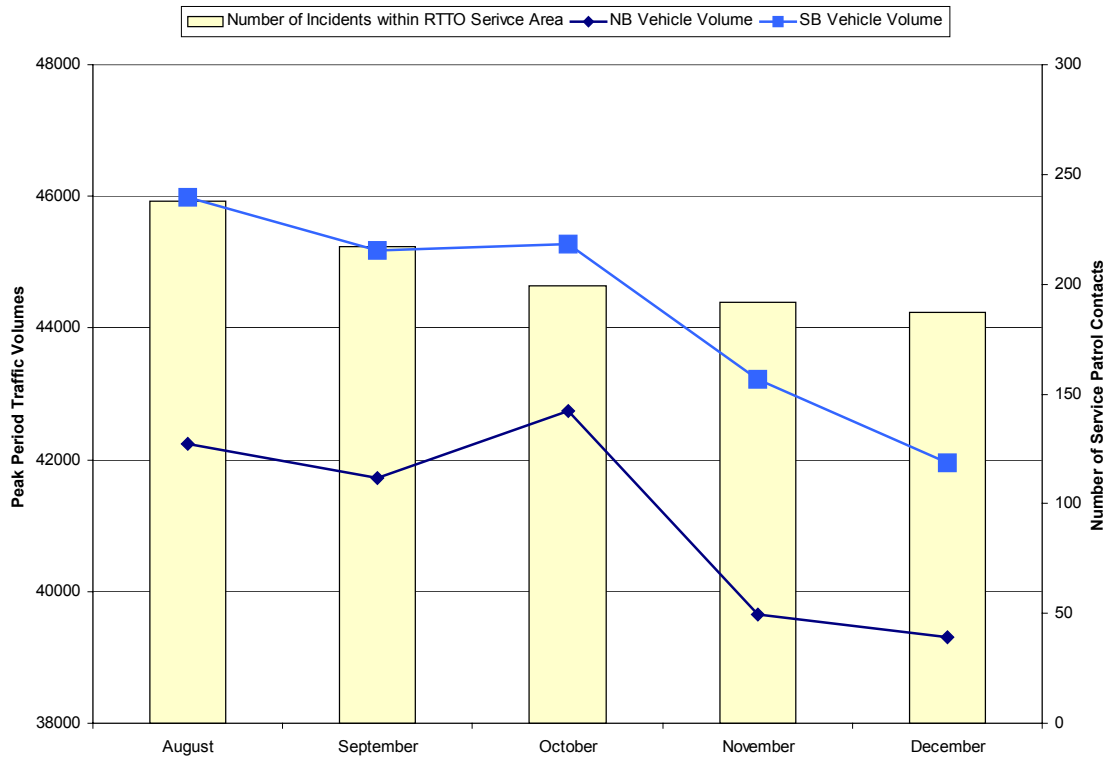


Figure 3-3b. Contacts vs. Monthly Traffic Volumes at University St., I-5

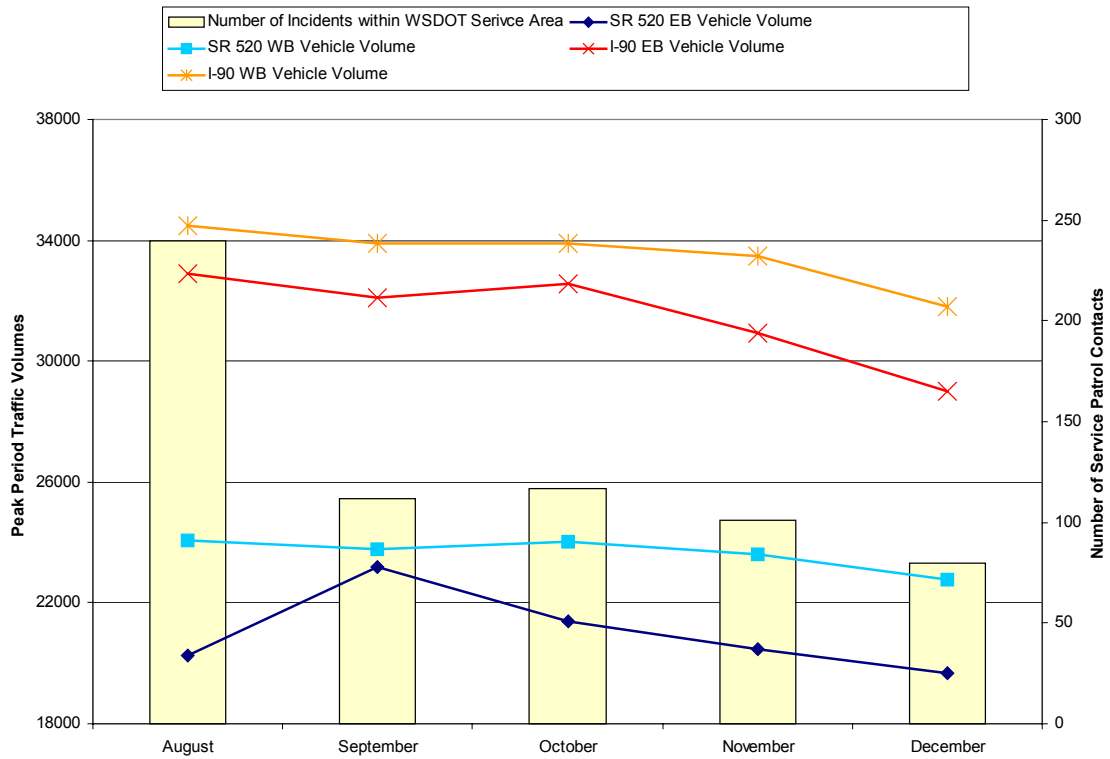


Figure 3-3c. Contacts vs. Monthly Traffic Volumes at Floating Bridges, I-90 / SR 520

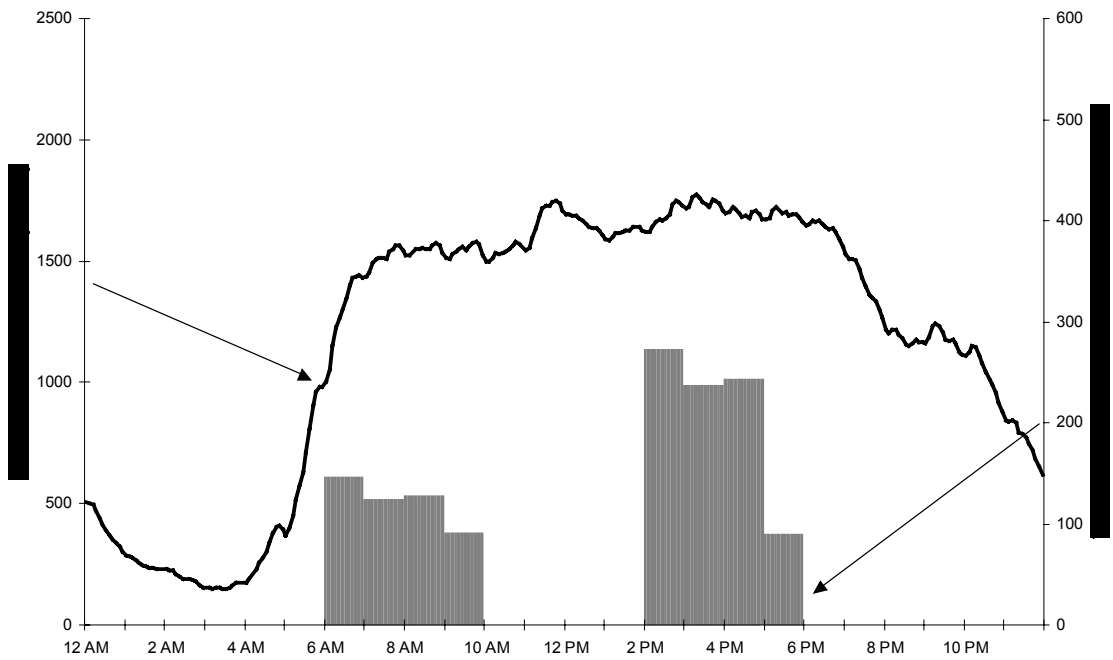


Figure 3-4a. Contacts vs. 24-Hr Traffic Volumes at Ship Canal Bridge, I-5

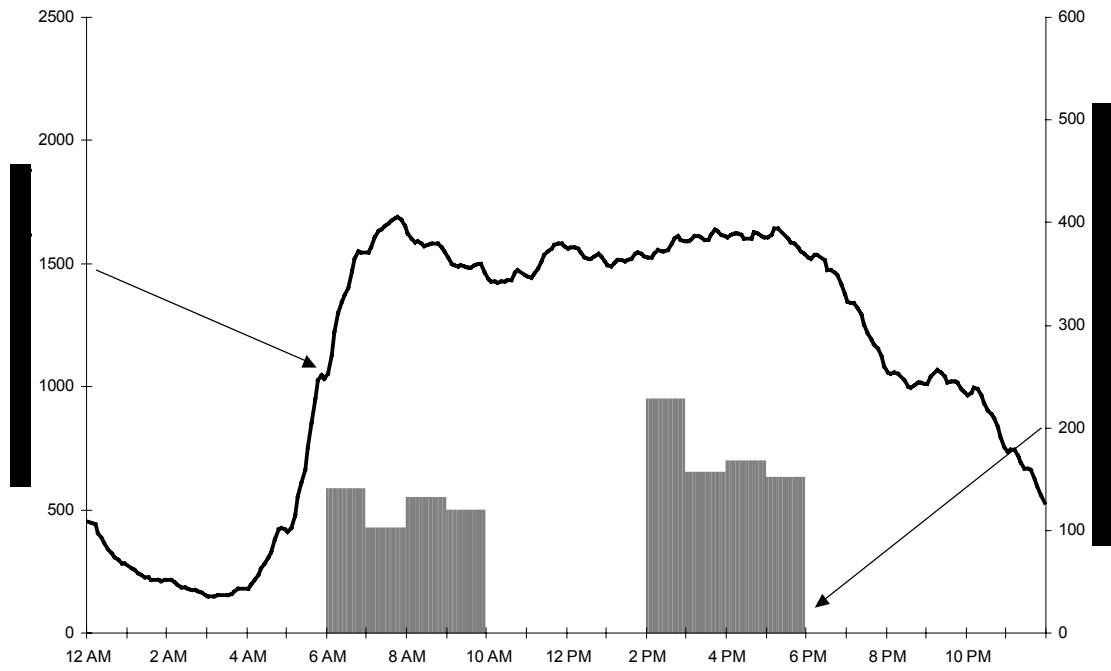


Figure 3-4b. Contacts vs. 24-Hr Traffic Volumes at University St., I-5

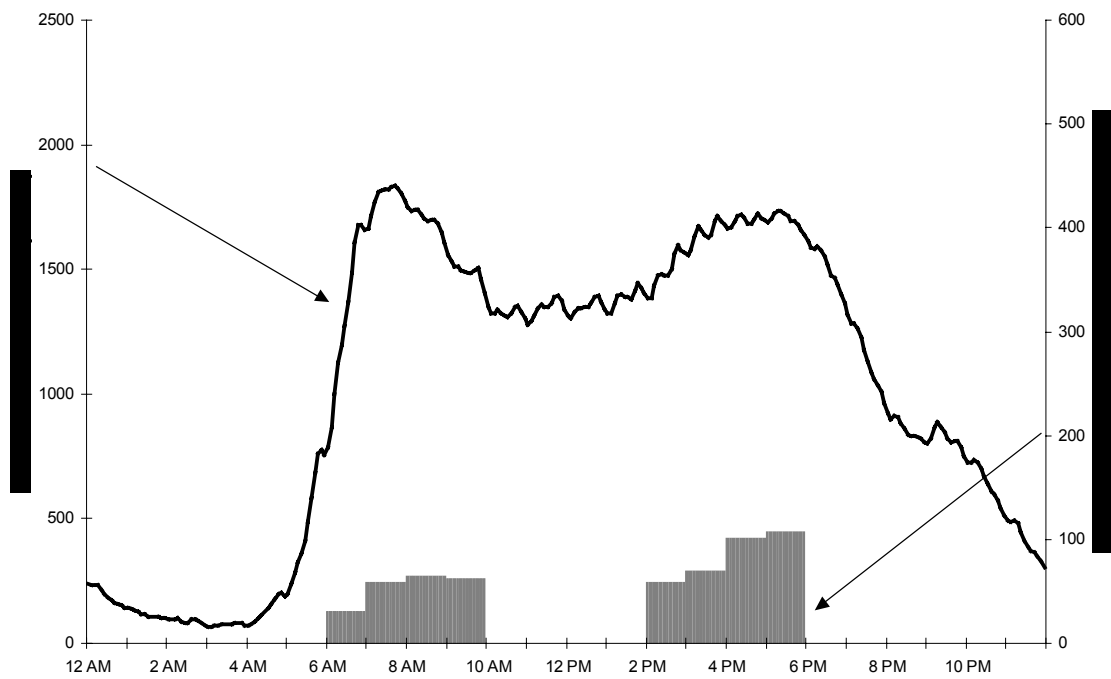


Figure 3-4c. Contacts vs. 24-Hr Traffic Volumes at Floating Bridges, I-90 and SR 520

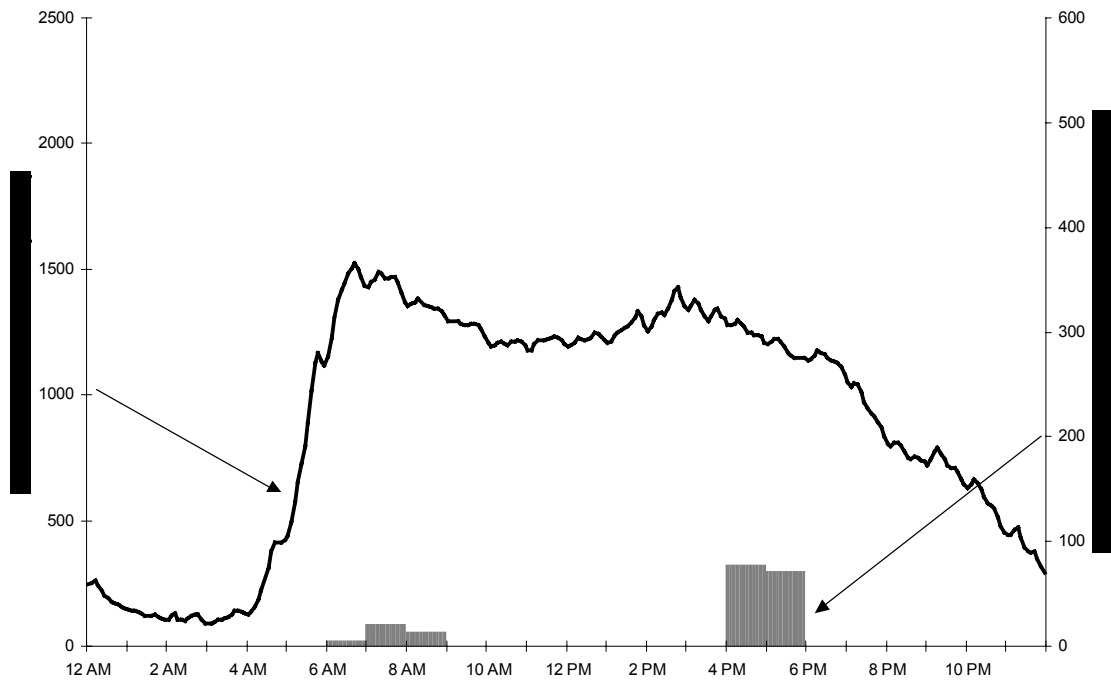


Figure 3-4d. Contacts vs. 24-Hr Traffic Volumes at NE 4th/8th St., I-405

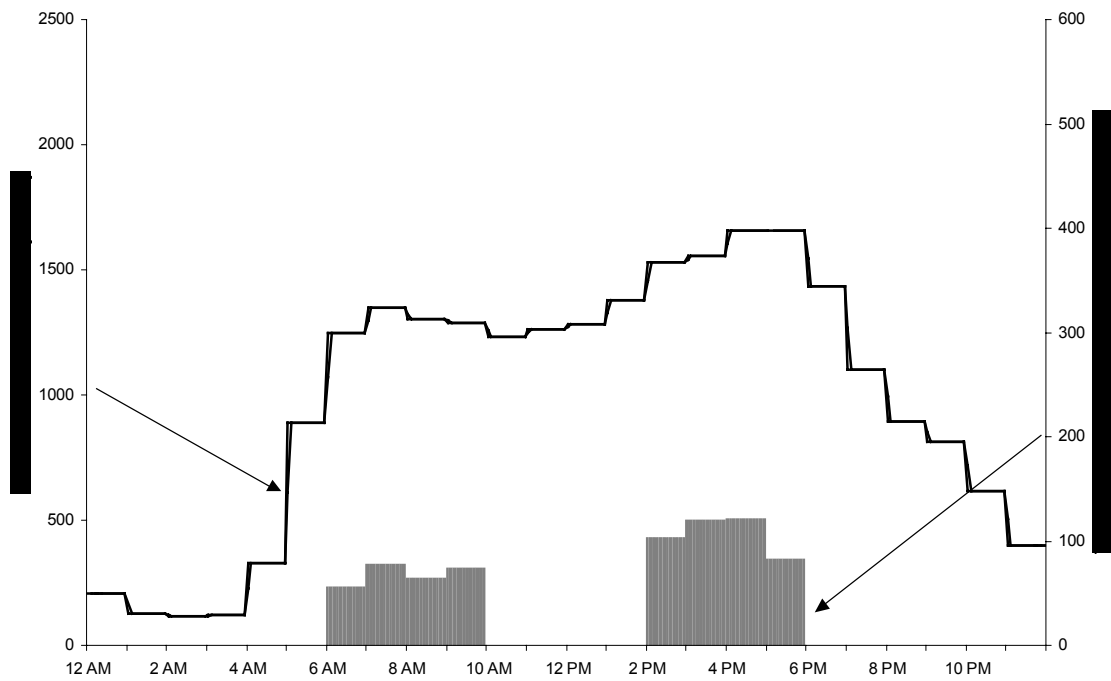


Figure 3-4e. Contacts vs. 24-Hr Traffic Volumes at West End of Narrows Bridge, SR 16

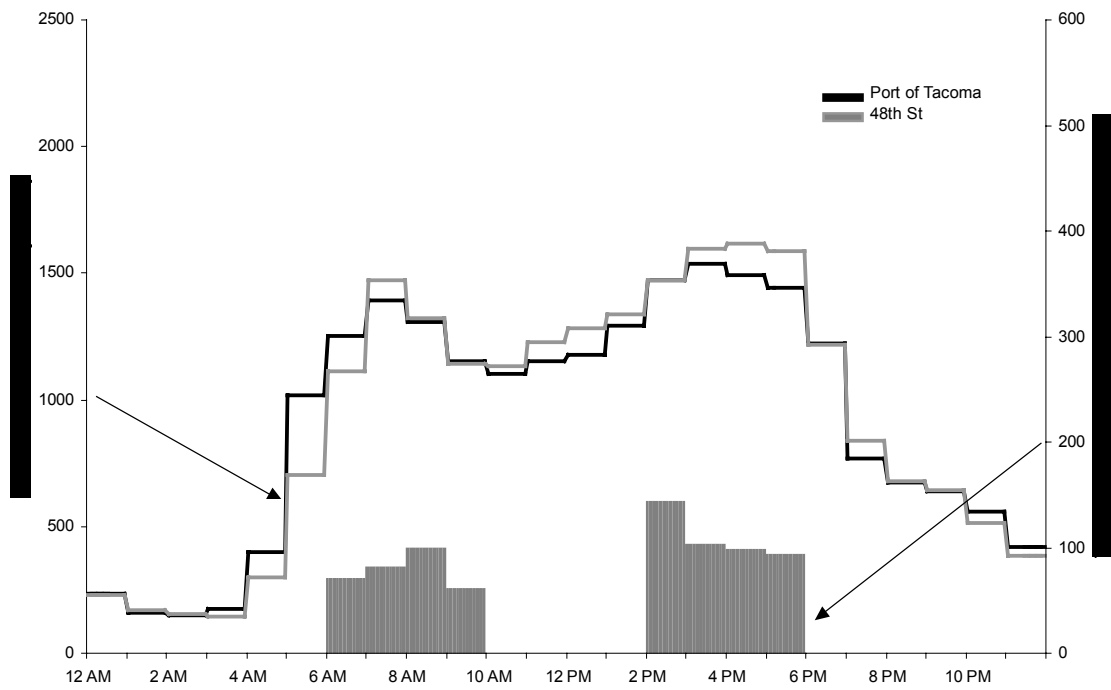


Figure 3-4f. Contacts vs. 24-Hr Traffic Volumes at Tacoma, I-5

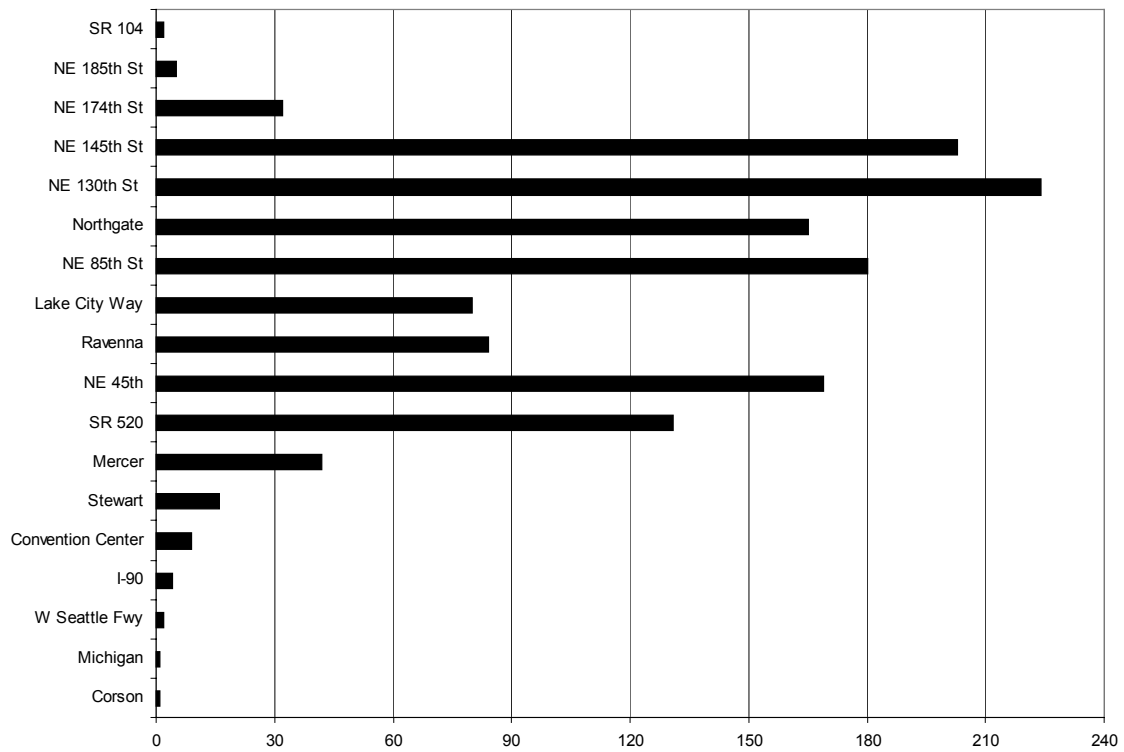


Figure 3-5a. Contacts by Location: I-5, Seattle, WSP Cadets

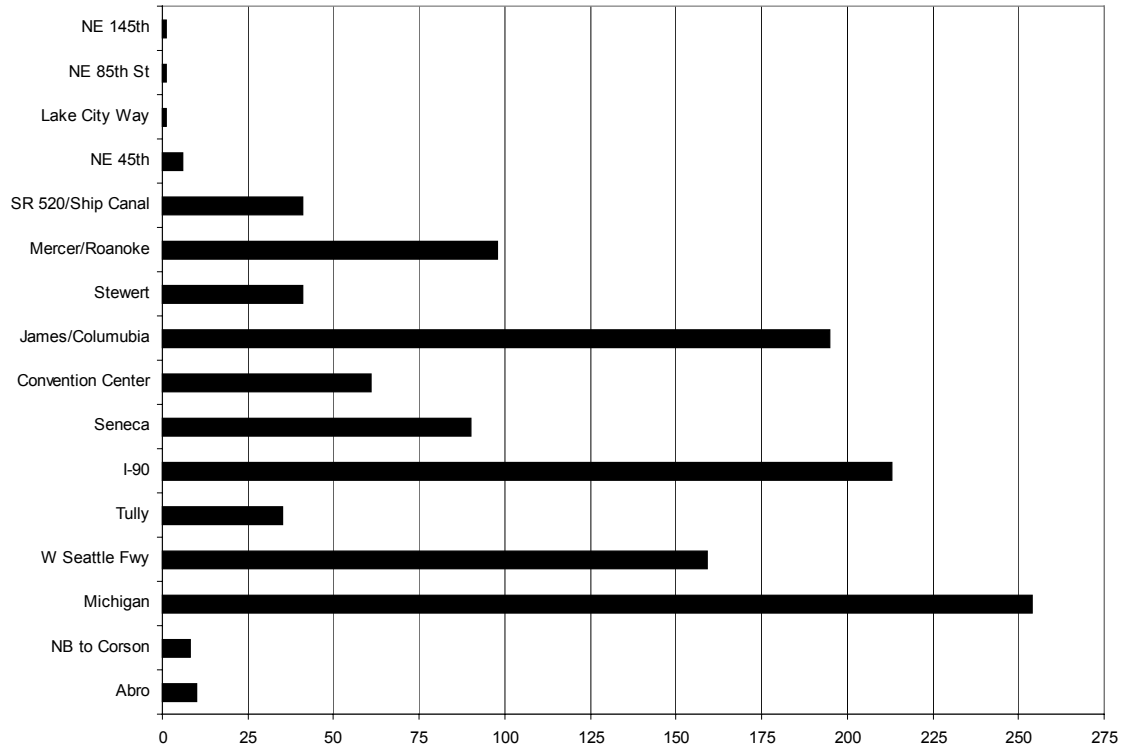


Figure 3-5b. Contacts by Location: I-5, Seattle, RTTO

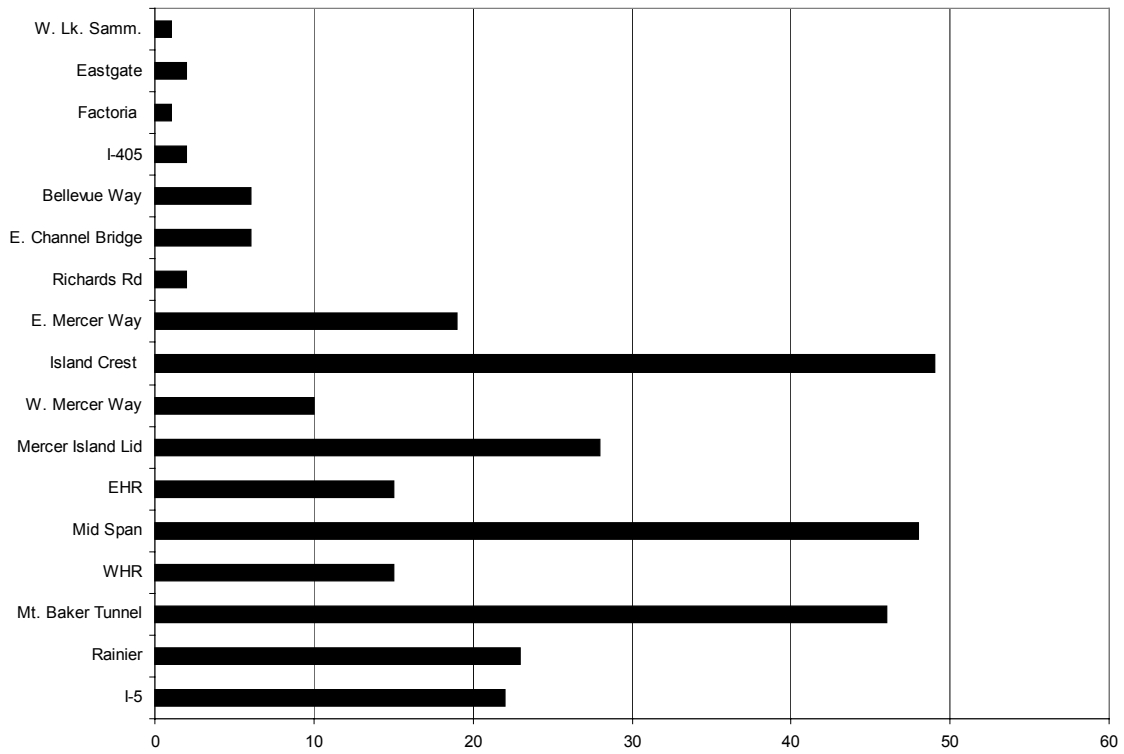


Figure 3-5c. Contacts by Location: I-90, Seattle, WSDOT

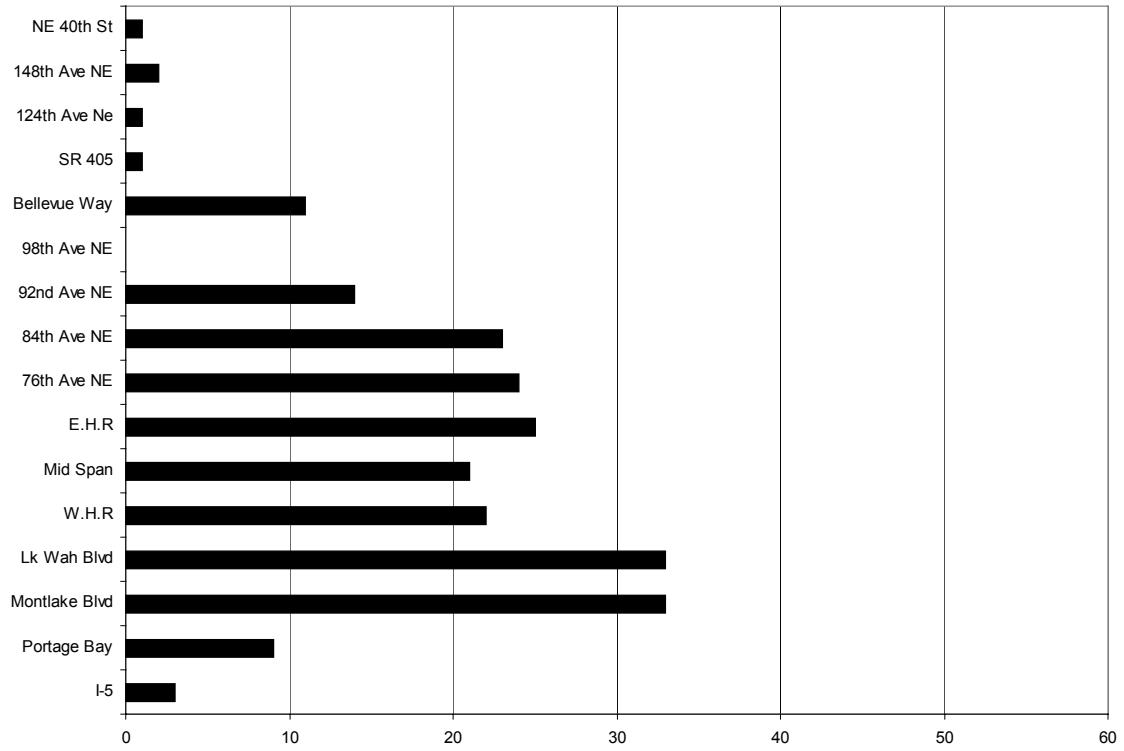


Figure 3-5d. Contacts by Location: SR 520, Seattle, WSDOT

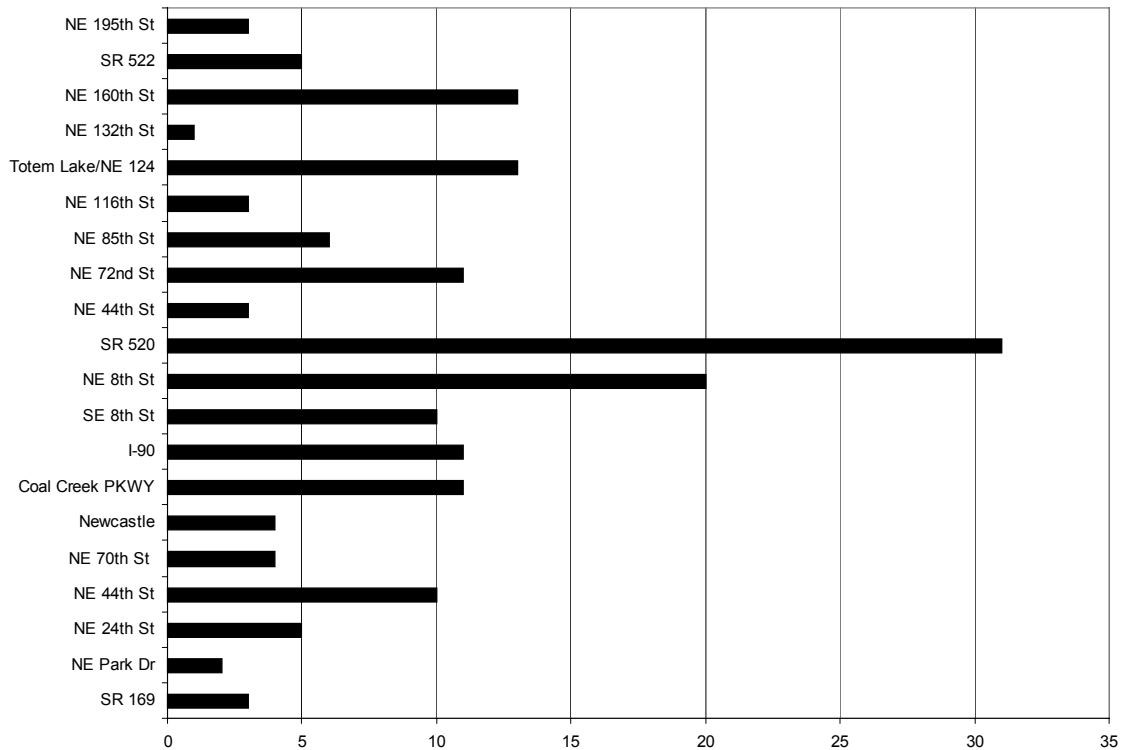


Figure 3-5e. Contacts by Location: I-5, Seattle, AAA

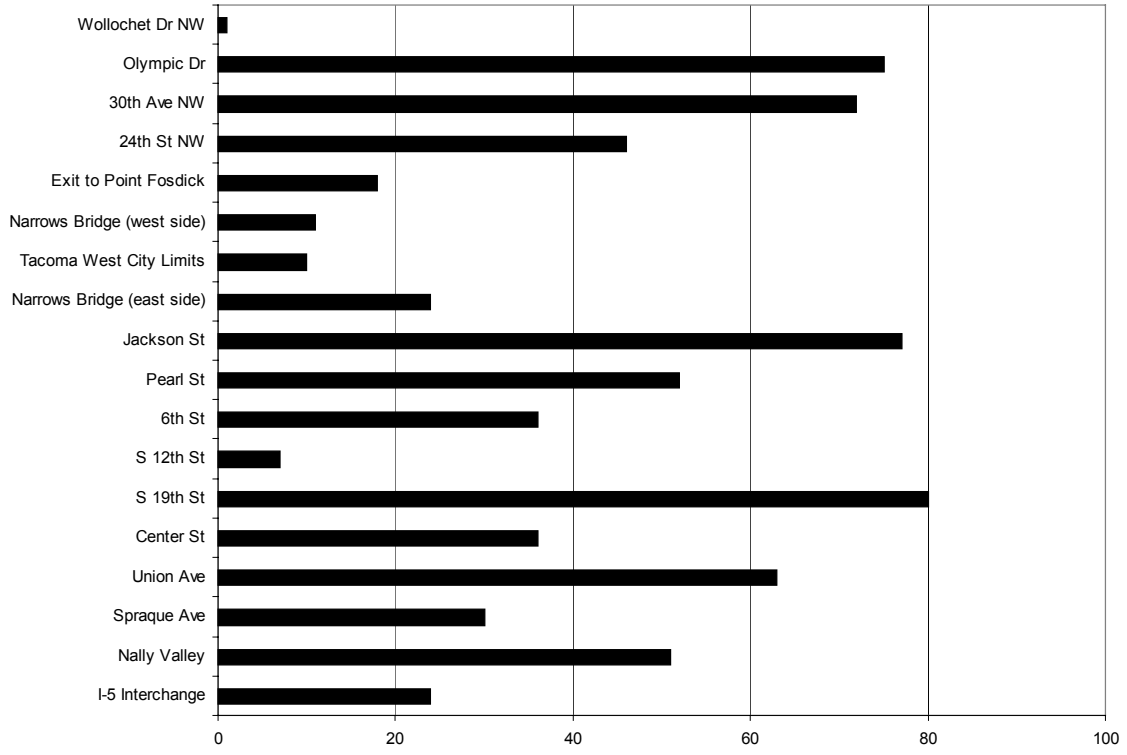


Figure 3-5f. Contacts by Location: SR 16, Tacoma, WSP Cadets

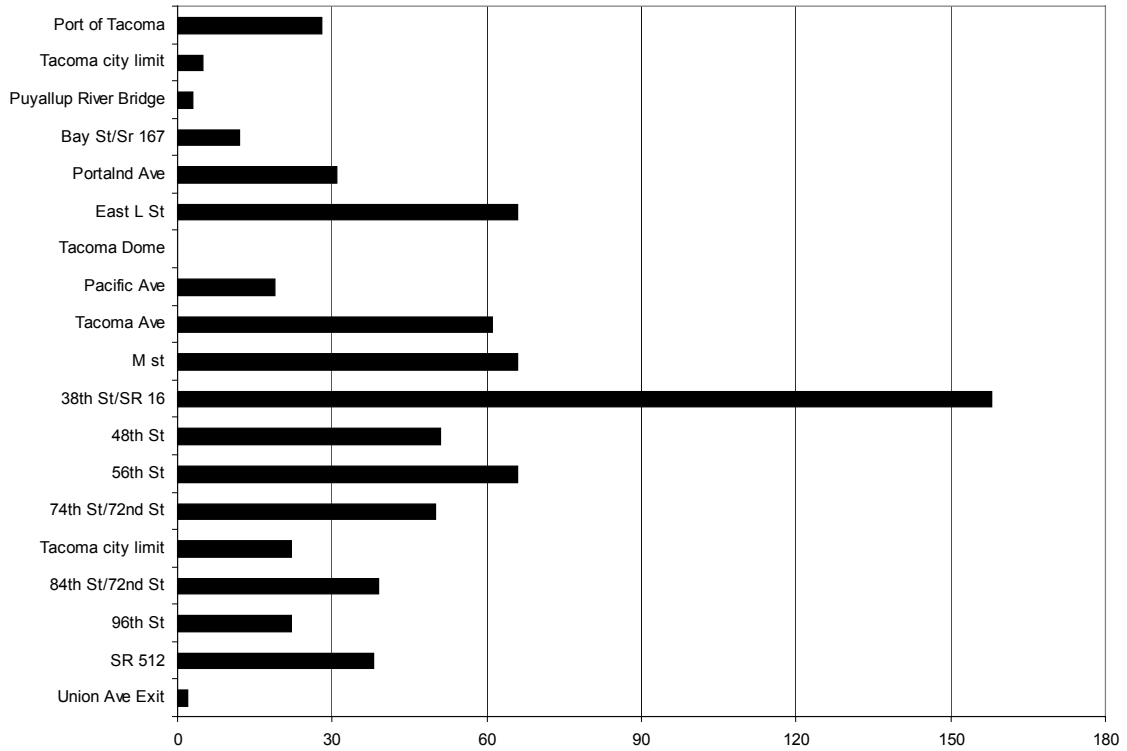


Figure 3-5g. Contacts by Location: I-5, Tacoma, RTTO

METHOD OF DETECTION AND NOTIFICATION

The majority of the Service Patrol's contacts were first detected by the Service Patrols themselves (see Figure 3-6). However, on the floating bridges, only about half of the contacts were detected by the Service Patrols. This may be because the SR 520 patrols, operated by WSDOT, had to respond to requests from the WSDOT's radio room in addition to WSP radio broadcasts. All of the AAA's contacts were made by its patrol; this is because AAA's RescueVan was not directly linked with either the WSP's or WSDOT's dispatch system.

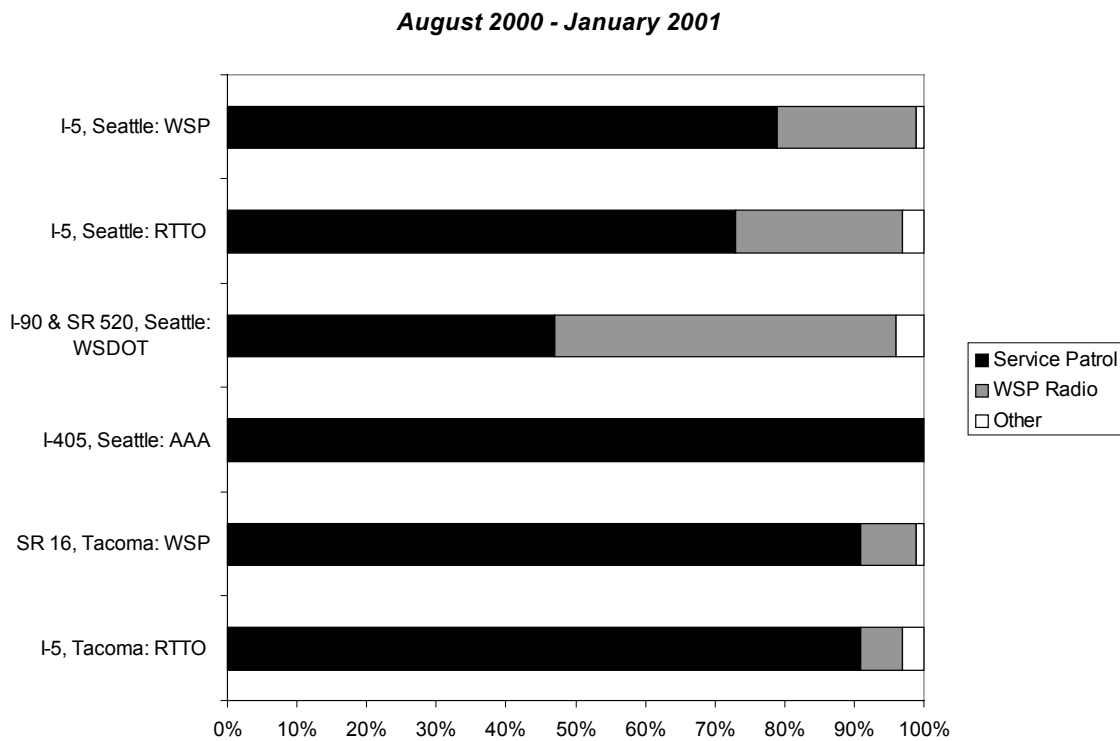


Figure 3-6. Method of Detection and Notification

FREQUENCY OF FALSE ALARMS

The frequency of false alarms was less than 10 percent (see Figure 3-7). Incidents that could not be located (“unable to locate,” or ULT) were generally reported by citizens to the WSP or WSDOT and were self-cleared before the Service Patrol arrived at the scene, or the information was incorrect. Sometimes a Service Patrol might spot a vehicle

stopping on the shoulder in the opposite direction of traffic, but the vehicle might have left before the Service Patrol arrived.

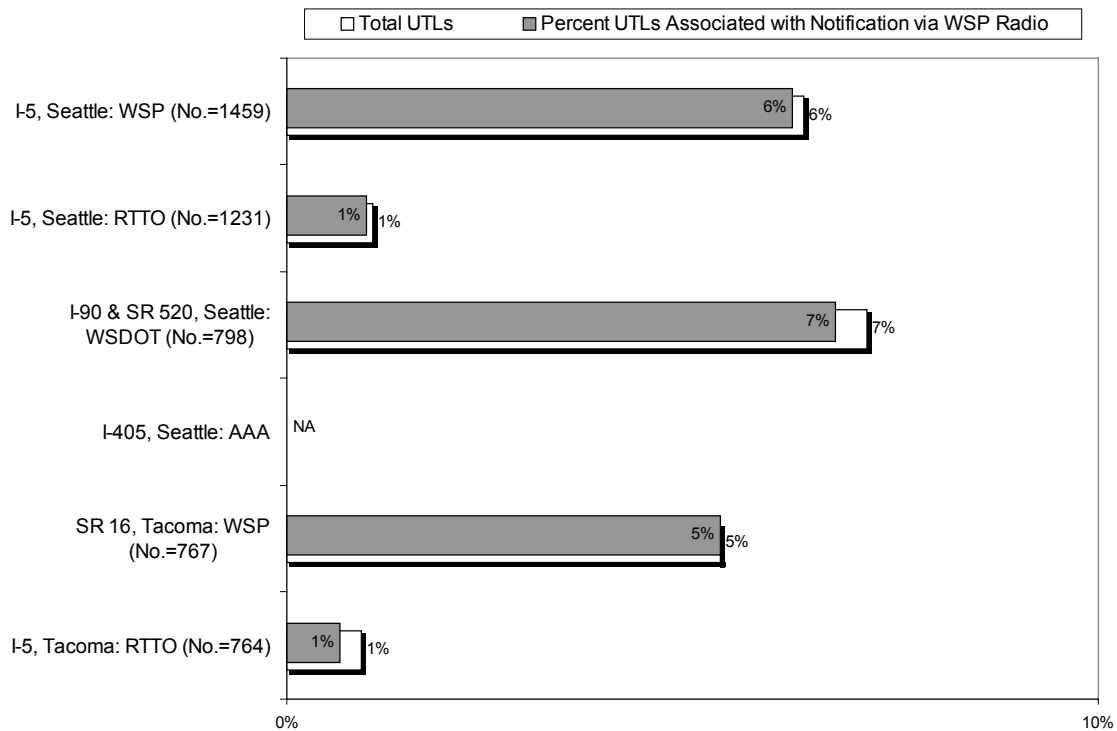


Figure 3-7. Frequency of False Alarms

TYPE OF CONTACTS

Regardless of the Service Patrol coverage area, most of the contacts were related to disabled vehicles (see Figure 3-8). Fewer collisions (2 to 3 percent) were found in the Tacoma area than in the Seattle area (8 to 15 percent). On average, debris occurred less than 5 percent of the time. From 3 to 17 percent of the contacts were related to other reasons, such as motorists stopping to make cellular phone calls, looking for directions, and securing loads. Abandoned vehicles were found slightly more frequently in the Tacoma area (see Figure 3-9).

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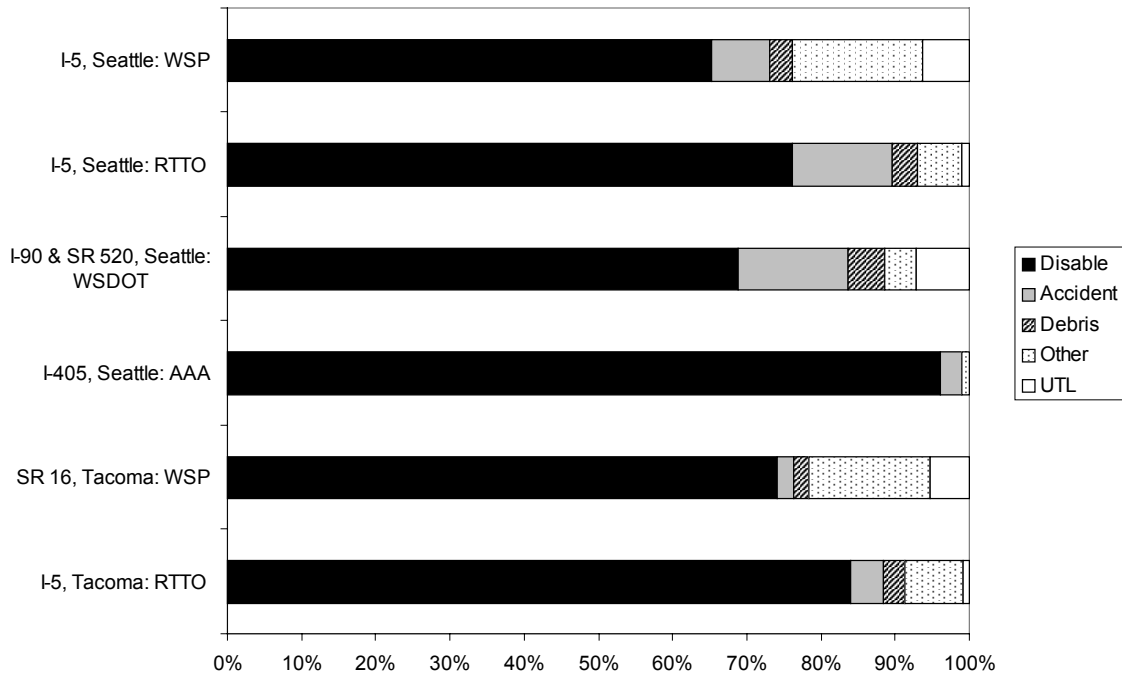


Figure 3-8. Distribution of Contacts by Type

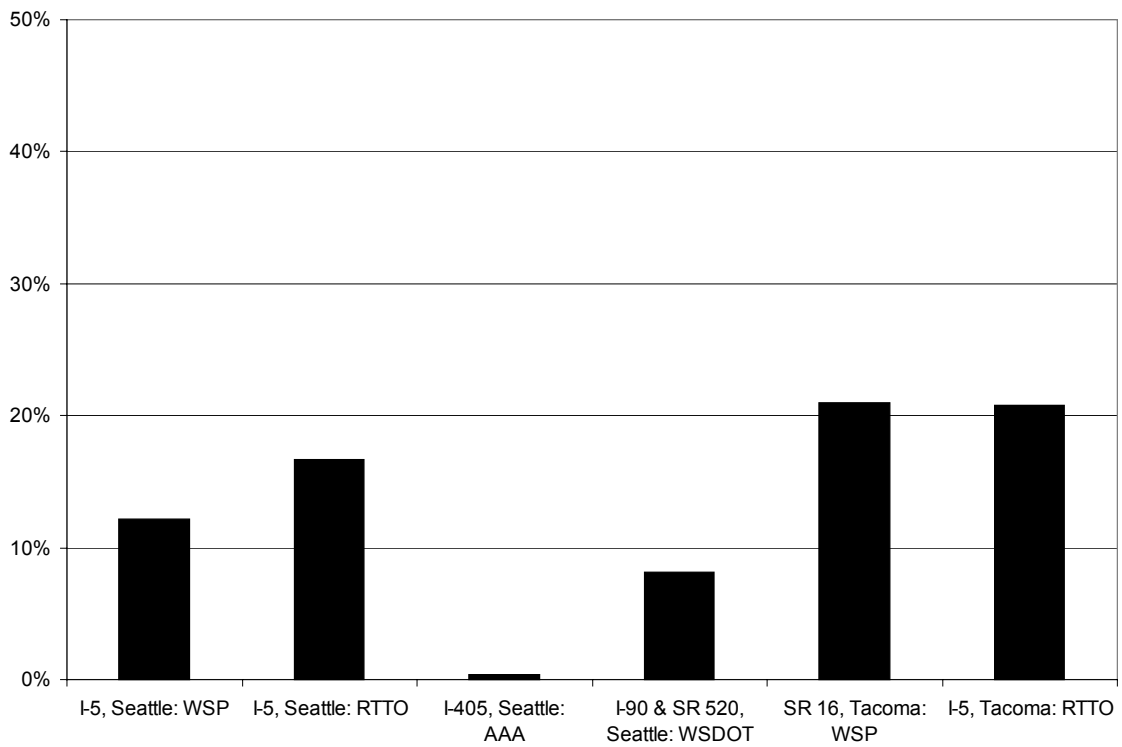


Figure 3-9. Frequency of Abandoned Vehicles

Figure 3-10 shows that overall, mechanical problems (26 percent), lack of fuel (14 percent), and flat tires (12 percent) were the most common causes of vehicle disablement. Depending on the location, the reasons for disablements varied slightly. For example, while mechanical problems occurred more than 25 percent of the time on average, lack of fuel occurred more frequently in the Seattle area than in the Tacoma area, and the Service Patrol on I-5 in Tacoma rendered services related to flat tires more often than the Service Patrol on SR 16.

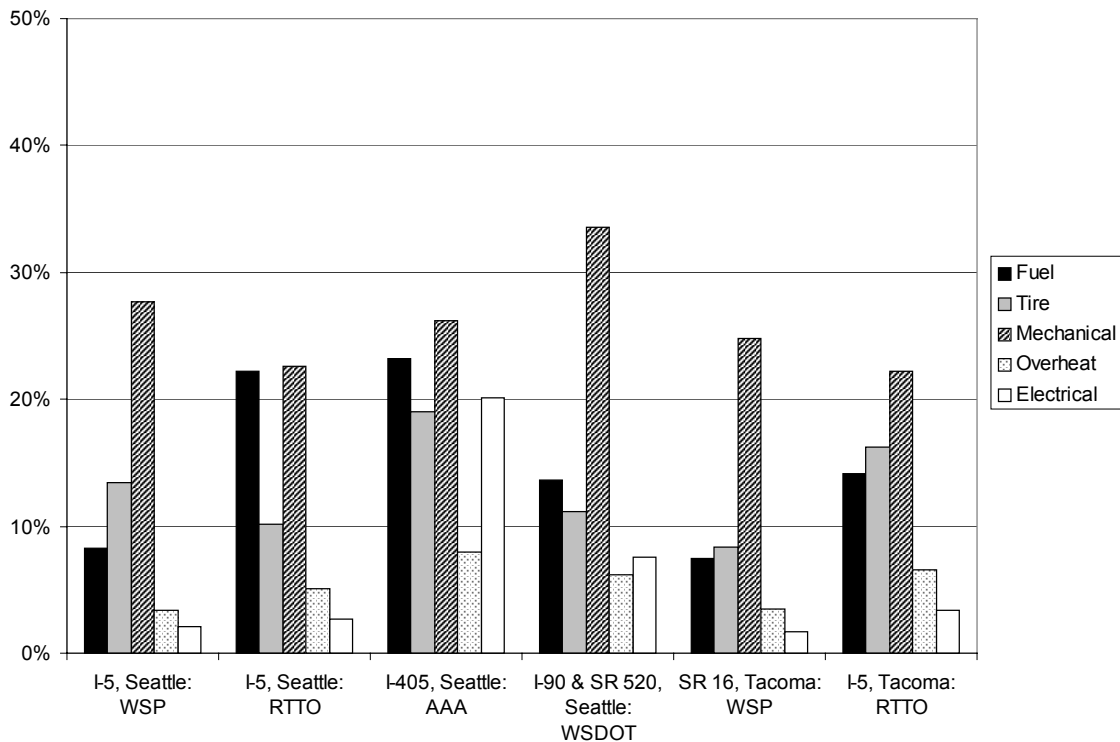


Figure 3-10. Common Causes of Vehicle Disablement

LANE BLOCKAGE

As Table 3-2 shows, most of the contacts that the Service Patrol responded to did not involve a lane blockage. However, the contacts that do cause lane blockages are especially critical to maintaining freeway efficiency. Lane blocking seemed to occur more frequently in Seattle. This may be because of the limited shoulder space (or no

shoulder space) on the SR 520 floating bridge and on along parts of I-5.

The causes of lane blocking incidents can be divided into three major categories: disablements, collisions, and debris. Of the motorist contacts that involved blocked lanes, the vast majority of them were not precipitated by collisions. Collision-related incidents caused about one third of the lane blocking contacts in almost all areas, except on SR 16 in Tacoma (22 percent). The majority of the lane blocking incidents occurred on mainline travel lanes, and most of the blocking incidents typically blocked only one lane.

Of the lane blocking contacts, the frequency of towing or pushing disabled vehicles or debris varied among service areas. For instance, in Seattle on I-5, for lane blocking contacts, the cadets requested additional towing 16 percent of the time, whereas additional towing was needed only 7 percent of the time in Tacoma on SR 16. The RTTOs in Tacoma provided tow service to 45 percent of the blocking contacts, whereas the towing service was only needed 28 percent of the time for the RTTOs in Seattle.

Table 3-2. Contacts with Lane Blockage

Agency	Contacts Involving Lane Blockage	Types of Blocking Contacts			Lane Blockage		Tow Required		
		Disabled	Accident	Debris	1-Ln	2-Ln	Push	Tow	Other Tow
I-5 Seattle WSP Cadets	13%	42%	34%	20%	90%	9%	20%	N/A	16%
I-5 Seattle RTTO	29%	56%	34%	10%	92%	7%	22%	28%	7%
Floating Bridges WSDOT	34%	61%	35%	14%	95%	4%	31%	16%	9%
I-405 Seattle AAA RescueVan	4%	100%	0%	0%	100%	0%	13%	13%	25%
SR 16 Tacoma WSP Cadets	4%	22%	22%	56%	81%	19%	11%	N/A	7%
I-5 Tacoma RTTO	7%	40%	33%	27%	84%	13%	7%	45%	0%

RESPONSE TIME

The Service Patrol took an average of less than 5 minutes to arrive at the scene of a blocking incident (see Table 3-3). The response time for AAA's RescueVan was the shortest because AAA's RescueVan did not communicate with either WSP's or WSDOT's dispatch system; all its responses were identified by AAA's patrol. Of the blocking contacts, about half were detected by the Service Patrols themselves and half involved being notified by WSP radio broadcast. The reduction in response time by the Service Patrol is discussed in Chapter 4.

Table 3-3. Response Time for Lane Blocking Contacts

	Response Time (min)	Detection Mode		
		Self	Radio	Other
I-5 Seattle WSP Cadets	3.9	48%	49%	3%
I-5 Seattle RTTO	3.7	45%	53%	2%
Floating Bridges WSDOT	4.6	33%	63%	4%
I-405 Seattle AAA RescueVan	0.0	100%	NA	0%
SR 16 Tacoma WSP Cadets	1.7	41%	44%	15%
I-5 Tacoma RTTO	2.8	56%	40%	4%

CHAPTER 4 COMPARISON OF SERVICE DELIVERY MODES

The operation of the Service Patrols was examined on the basis of how the pilot program was implemented. Note that the actual motorist assistance services varied slightly from one Service Patrol mode to another (see Table 4-1). Each mode of service delivery provided some unique customer services, while achieving the patrols' primary goals: clearing lane blockages and assisting motorists.

GEOGRAPHIC COVERAGE OF SERVICE AREAS

Service Patrols operated by the cadets and RTTOs covered selected high volume freeway segments on I-5 and SR 16 in the Seattle and Tacoma areas. WSDOT's trucks concentrated mainly on the floating bridges on I-90 and SR 520. As indicated in the Figure 3 series, the traffic volumes varied from one freeway segment to another. While most of the service modes covered limited areas under the pilot program (~10-mile segment per mode), AAA (and other approved, privately sponsored "motorist assistance" service providers) ranged over a wider service area on I-405 (~22-mile segment). This provided more widespread advertising visibility for sponsors but a less concentrated response.

Table 4-1. Differences Among Service Modes

	WSP Cadets	RTTO	WSDOT Trucks	AAA RescueVan
Geographic Coverage of Service Areas (Including all ramps, express lanes, and collector/distributors)	Seattle (9 miles) I-5 between 145 th St and Roanoke St Tacoma (11 miles) SR 16 between I-5 Interchange and Olympic Dr	Seattle (7 miles) I-5 between Mercer St and Corson-Michigan St Tacoma (11 miles) I-5 between Port of Tacoma and S 38 th St (AM), between SR 16 and SR 512 Interchange (PM)	Seattle (16 miles) I-90 between I-405 Interchange and 4 th Ave SR 520 between 108 th Ave and I-5 Interchange	Seattle (22 miles) I-405 between NE 195 th to Renton
Patrolling Units	2 in Seattle, 1 in Tacoma	2 in Seattle, 1 in Tacoma	3 in Seattle	1 in Seattle
Weekday Service Hours	6:00 – 10:00 AM 2:00 – 6:00 PM	6:00 – 10:00 AM 2:00 – 6:00 PM	5:30 – 9:30 (6:30 – 10:30) AM 1:30 – 6:30 (2:30 – 7:30) PM	6:00 – 9:30 AM 3:30 – 7:00 PM
Training	Staff Training	Jointly trained by WSDOT/WSP	Trained by WSDOT for other maintenance and emergency duties and traffic control (equipped with flagging cards)	Staff training to provide minor vehicle maintenance
Commercial Driver’s License (CDL)	Not required	Not required	Required	Not required
Communications	Formal WSP Protocol	Formal WSP Protocol	Formal WSP Protocol	No Formal WSP Protocol
Tag and Mark of Abandoned Vehicles	Tag	Mark	Mark	Mark
Vehicle	Jeeps (Push bumpers)	Tow Truck (Class A, B, D, or E)	Tow Truck (Class D)	Passenger Van
Tow	No	Yes	Yes	No
Gas	No	Yes	Yes	Yes
Cellular Phone	Some have private cellular phones, however it’s not required under contract	Some have private cellular phones, however it’s not required under contract	Yes	Yes

SERVICE HOURS

As Table 4-1 shows, while the service hours for the Service Patrol operated by the WSP cadets and RTTOs were restricted to 6:00 AM to 10:00 AM and 2:00 PM to 6:00 PM, the hours for other roving patrols were slightly different because of the characteristics of the travel demand in each corridor. The WSDOT's trucks patrolled the SR 520 and I-90 floating bridges from 5:30 AM to 10:30 AM and from 1:30 PM to 7:30 PM and for one day a week from 9:30 AM to 6:00 PM. AAA's RescueVan operated along I-405 from 6:00 AM to 9:00 AM and from 3:30 PM to 7:00 PM.

TRAINING

As mentioned previously, while all Service Patrols' primary goal was the same—to detect and clear the roadway as quickly as possible and to assist motorists—the training effort varied for each service delivery mode. Except for the Service Patrols operated by the RTTOs, which were jointly trained by WSDOT and the WSP, the other Service Patrols (i.e., operated by the WSP cadets, WSDOT, and AAA) were trained by their own agencies for their unique purposes. For instance, WSP cadets were trained differently because they would not operate tow-equipped vehicles and they represented an enforcement agency. WSDOT Service Patrol staff were trained to perform other WSDOT maintenance and operations tasks, such as opening and closing Express Lane gates, clearing clogged catch basins, and performing traffic control. AAA's RescueVan operator was specifically trained to perform minor vehicle maintenance.

SERVICE DELIVERY

All the Service Patrols provided simple services such as a jump start or a tire change, things that should routinely take about 10 minutes to complete. However, the services provided by each delivery mode were not identical. In addition to routine service tasks, each service delivery provider performed certain unique institutional duties and functions, given its participation and teamwork in the "Service Patrol" arena. For

example, WSDOT tow truck operators performed other maintenance and operations tasks, and they were required to obtain a commercial driver's license while other service operators did not have to. These requirements allowed more flexible use of these staff to meet WSDOT needs while also ensuring that staff time was used efficiently throughout the work shift. All Service Patrols, except AAA's RescueVan, were required to follow formal WSP communications protocol. While WSP cadets tagged all abandoned vehicles, officially setting a 24-hour clock for vehicle impound, Service Patrols operated by the RTTO, AAA, and WSDOT only marked abandoned vehicles for interagency reference.

The services offered by the Service Patrol were also influenced by the equipment they used. The WSP-operated patrols drove push bumper-equipped jeeps. Because participation in the patrol effort was open to all certified tow operators, the RTTO Service Patrols operated a variety of tow vehicles (e.g., classes A, B, D, or E). One of the tow vehicles was called the "Bus" because it could transport up to twelve people. The "Bus," a class "B" tow vehicle, was unique in that it allowed both towing capability and the ability to transport more than two stranded motorists. However, its size did raise concerns with WSP officers about maneuverability within tight freeway right-of-way and into limited drop areas. These issues were successfully resolved. The WSDOT patrol operated Class D tow trucks. AAA used vans as its privately sponsored motorist assistance vehicles.

The capabilities of these vehicles differed. For example, the WSP-operated jeeps could only push vehicles; however, the smaller size of the WSP jeeps allowed them to maneuver more quickly through stopped traffic to reach an incident scene. The RTTO vehicles were all tow equipped, which gave them the ability to relocate disabled vehicles or debris to the shoulder or off the freeway to a drop zone area by towing, pushing, or hauling. Tow-equipped patrols can remove some vehicles that can not be moved with push bumpers, which means some incidents may be cleared faster.

The other major differences in service delivery were the ability to carry gasoline and how and when cellular phones were made available to stranded motorists. The only service delivery mode that did not carry gasoline was the WSP. Under the pilot contract, the cadets and the RTTOs did not have to carry cellular phones. Instead of direct phone access, Service Patrols could offer motorists the option of having assistance calls placed by the WSP's dispatch office. Some of the cadets and RTTOs did carry private cellular phones, but none of the cellular phone charges were covered by the current contract. The WSDOT trucks and AAA's RescueVan both provided cellular phone access to stranded motorists.

PUBLIC ATTITUDES TOWARD DIFFERENT MODES OF SERVICE DELIVERY

One intention of the Service Patrol survey was to determine whether the public's attitudes changed with different modes of service. The survey results indicated that the positive viewpoint toward the Service Patrol service was uniform, regardless of the service mode (see Figure 4-1). However, many motorists did have a different first reaction toward uniformed law enforcement officers (or state agency personnel) than toward private tow truck operators.

In the beginning of the pilot program, the RTTOs in the Tacoma area indicated that stranded motorists were worried that fees would be associated with the service. Although Service Patrol signs were attached to RTTOs' vehicles, and the RTTOs were required to wear white coveralls or a white shirt and white pants with a reflective traffic vest and a WSDOT-supplied soft yellow cap, many motorists' initial thought appeared to be, "How much is it going to cost me?" This did not appear to be a concern with either the WSP- or WSDOT-operated Service Patrol, to which stranded motorists generally appeared to react as if, "Help is on the way!" The issue was resolved when the RTTO operators carried informational brochures about the Service Patrol program to help

motorists understand the service.

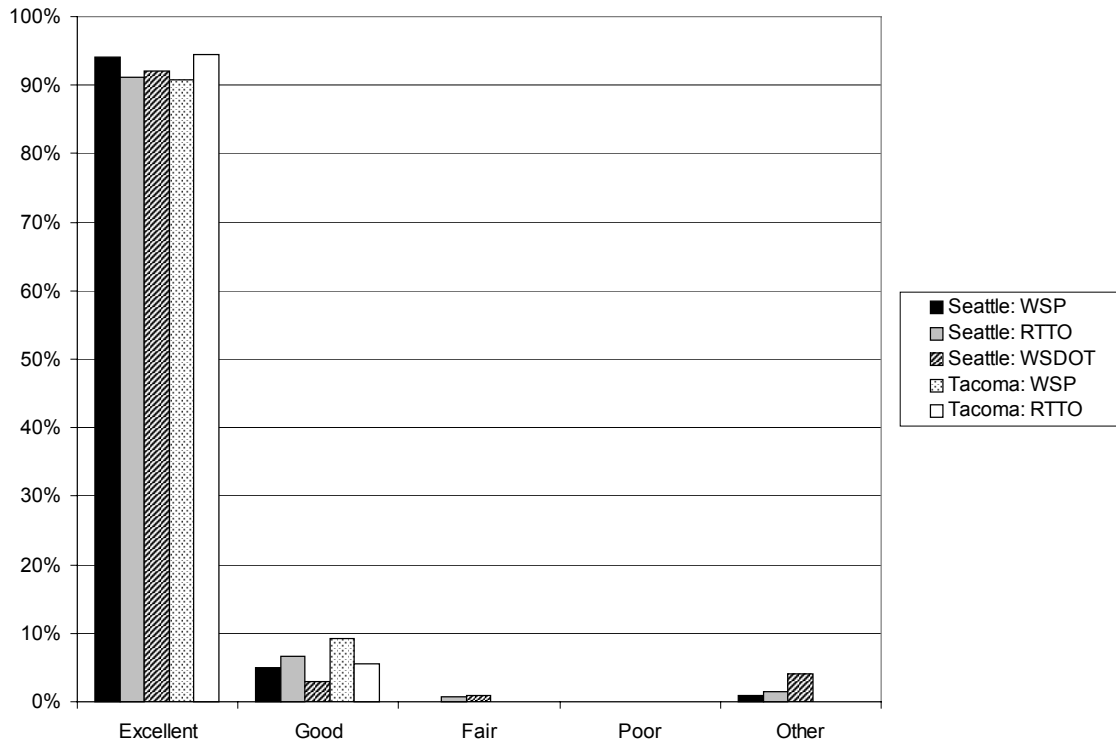


Figure 4-1. Public Rating on Service

PROGRAM IMPACT

Rating from the Public

One of the major benefits of the Service Patrol program was that it had broad public support. As Figure 4-1 shows, the public response to the Service Patrol program was overwhelmingly positive. Over 90 percent of the assisted motorists who provided feedback (16 percent of all assisted motorists) for the evaluation rated the service as “excellent.” The Service Patrol’s assistance was viewed by the aided individuals as

- excellent/wonderful/fabulous
- polite/ courteous/positive
- professional/ helpful
- patient/friendly/pleasant
- understanding/thoughtful.

Most of the respondents were not aware of the program until the day they received assistance (see Figure 4-2). Of the Service Patrols operated by different entities, more people knew about those operated by WSDOT via newspaper, radio, and TV. This may be because the service on the floating bridges was implemented much earlier than the service for other areas.

When motorists did learn about the program, public sentiment was overwhelmingly favorable. Written comments on the service routinely included praise such as the following:

- “Thank you so much for saving me!!!”
- “Very considerate, friendly, and empathetic. Let me know if you need a testimony. My motor club could not help me but you came through.”
- “My service was better than I hoped for. Thanks so much!!”
- “I normally complain a lot about how my tax dollars are spent, but I'm thankful your tow truck was there to help me that day!”
- “Advertise with flyers so people can support this program. I got to work much faster with this service.”

Many respondents suggested that the state continue the service, increase the number of patrol vehicles, and expand the geographic area covered by the patrols. The ability to provide cellular phone service to the stranded motorists to contact families or make additional plans was often suggested by public feedback.

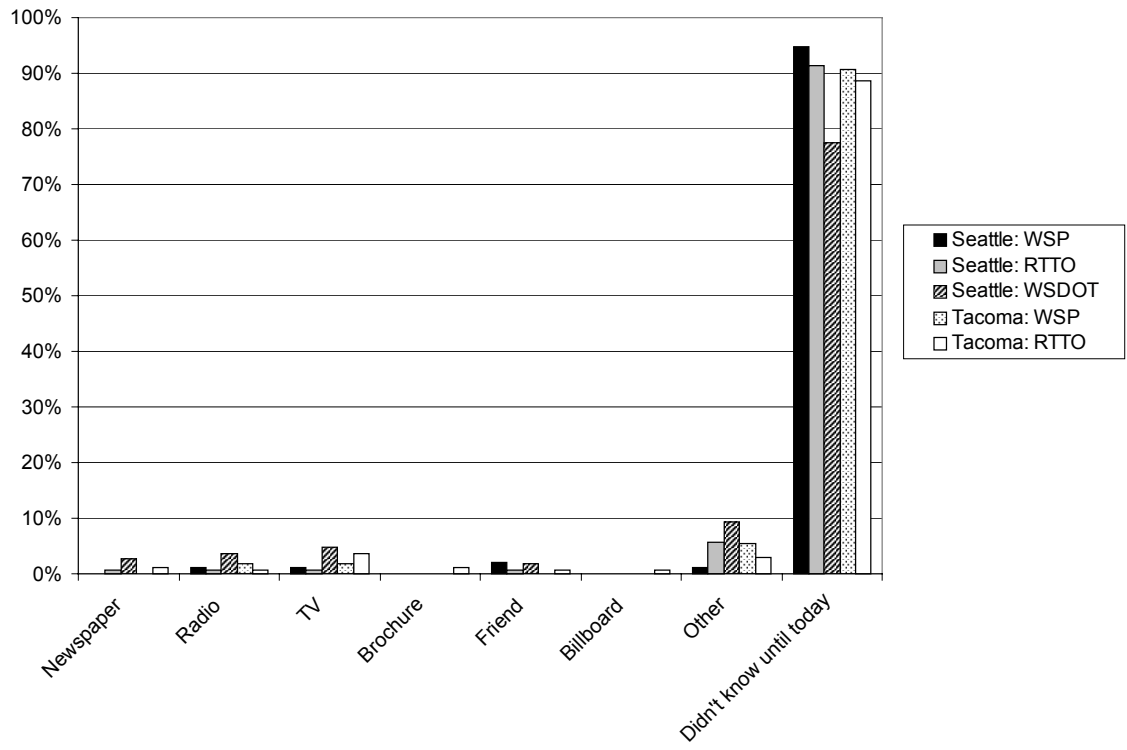


Figure 4-2. Public Awareness

Interagency Cooperation

A significant benefit of the Service Patrol pilot was the much improved interagency cooperation and coordination among WSDOT, WSP, and the towing industry. The pilot program fostered an environment that combined numerous interest groups from the public (i.e., WSP, WSDOT) and private sectors (i.e., RTTOs, AAA). Although AAA was not directly involved with the pilot program (e.g., it did not receive grants for service), it did demonstrate commitment through active participation and contribution to meet the goals of the program. AAA also shared its experiences with its unique qualifications in roadside services.

The partners for this pilot program met regularly to coordinate their efforts on project implementation. These regular meetings allowed an opportunity for stakeholders to be updated about project status. They also provided an excellent forum in which issues

could be raised and resolved in a timely fashion. While the main supervisory role for the program resided with WSDOT administrators, all the stakeholders participated in working out program details such as issues related to roles, responsibilities, equipment, and training. Problems or issues were discussed, and solutions were provided as a group. For instance, one of the discussions was about the magnetic Service Patrol signs that were required to be placed on all the Service Patrol vehicles. These signs were often lost and needed replacement because they did not attach securely to all of the differently shaped patrol vehicles. Also discussed was how to deal with the fact that some tow truck operators had difficulty providing sufficient numbers of properly trained personnel. These meetings were viewed very positively because they allowed stakeholders to raise their concerns, have those concerns addressed by the whole group, and learn more about each other's operations.

The project also provided the opportunity for each of the participating agencies to learn more about each other's operations. WSDOT operators also felt that the pilot program resulted in improved communication and a better working relationship with the WSP officers. Increased levels of interaction and joint training between WSP and WSDOT resulted in more effective working arrangements between the field staffs of these two agencies. Better working arrangements equated directly to more thorough achievement of both agencies' goals.

Personnel Utilization

For WSP, having cadets patrol the freeway during commute hours resulted in two major benefits. First, it helped with WSP's calls for services so troopers could better allocate their effort and spend their time on more pressing issues. Second, the Service Patrol program gave prospective WSP officers additional opportunity to train under real traffic conditions.

The required tasks provided the cadets the chance to contact and deal with the

public, learn how to handle themselves in traffic, clear collisions, use the radio, and practice all the other aspects of being a trooper. They also had the opportunity to interact with other troopers, giving the troopers a chance to see how the cadets functioned and to review their job performance under realistic job conditions.

Reduced Incident Response Time

For blocking incidents, before implementation of the Service Patrols, 5 minutes to almost 10 minutes would pass before assistance arrived at the scene. With Service Patrols, on average, assistance took less than 5 minutes to arrive at the scene (see Table 4-2). The reduction in incident response time ranged from 44 to 77 percent. As indicated in Table 3-3, the fact that the Service Patrols identified half of the blocking incidents they responded to means that they provided a significant improvement in response time. Note that without Service Patrols, the response time would be much higher on the SR 520 floating bridge, where each incident is a blocking incident and congestion caused by the incidents would significantly delay responding vehicles.

A conservative estimate of time savings, based only on the reduction in response time for lane blocking incidents over a one-year period, is that the current level of Service Patrol would save between 4,400 and 13,000 vehicle hours of delay. Assuming an average person-hour of \$12.40 and a vehicle occupancy rate of 1.2, the annual savings in delay costs to the public would be about \$328,000.

This monetary savings estimate does not include the benefits assisted motorists receive. It also underestimates the savings that Service Patrols produce by more quickly detecting roadway problems. (That is, we cannot estimate the time saved when Service Patrols see the incident first, rather than waiting for a passing motorist to see a problem and phone the WSP. We can only measure the savings that occur after that call takes place.) In addition, the computed value does not account for any savings from a reduction in secondary accidents, which Service Patrols prevent by quickly removing

roadway blockages and debris. In doing this, they decrease both the occurrence and duration of congestion and accident-causing weaving by vehicles trying to avoid debris.

Table 4-2. Response Time Reduction for Lane Blocking Incidents

	SEATTLE		TACOMA	
	WSP	RTTO	WSP	RTTO
Number of Motorist Contacts	1459	1231	767	764
Percent of Blocking Incidents	13%	29%	4%	7%
Tow Required	16%	28%	7%	45%
Without Service Patrol	7.0	9.5	7.5	5.2
With Service Patrol	3.9	3.7	1.7	2.8
Estimated Reduction in Response Time (min)	3.1	5.8	5.8	2.4
	44%	61%	77%	46%
Estimated Annual Reduction in Delay (veh-hr)	4440	13048	1764	2812
Estimated Annual Cost Savings	\$66,100	\$194,200	\$26,200	\$41,800

COST ANALYSIS

As Table 4-3 shows, the RTTO had the highest hourly rate (\$60.00). The costs for the WSP cadets and WSDOT-operated Service Patrol were comparable—\$37.00 per hour vs. \$35.46 per hour. Note that the WSP’s hourly rate could fluctuate if the roving speed was assumed differently for vehicle cost (i.e., 25 mph yields \$35.35 per hour). AAA’s RescueVan had the lowest hourly rate (\$26.04 to \$31.25), which was based on AAA’s estimate. Most of WSDOT’s administrative costs were absorbed by the Traffic Operations program budget, and expansion of the pilot program would likely increase WSDOT’s administrative cost, particularly because of the need for expanded training programs.

Table 4-3. Program Cost Breakdown by Hour

	RTTO (Pilot Program)	WSP (Pilot Program)	WSDOT (Existing Service on the Floating Bridges)	AAA (Private Service)
Hourly Labor Rate	(Negotiated contract hourly rate ⁴)	\$27.25	\$27.92	N/A ⁷
Hourly Vehicle Cost		\$9.75 ⁵	\$7.54 ⁶	N/A ⁷
Hourly Cost Rate	\$60.00	\$37.00	\$35.46	\$26.04 - \$31.25
Annual Cost for one Service Patrol unit	\$115,000	\$71,000	\$68,000	\$50,000 - \$60,000

The costs incurred by service modes can also be broken down by the number of motorist contacts and the coverage area. The costs presented in Table 4-4 include the labor and equipment to operate at current level, five days a week, during 4-hour AM and PM peak periods, from August 2000 to January 20001, on *very different* sections of congested freeways. On a per contact basis, the WSP's cadets cost the least. RTTOs' rate was still higher than the WSP's for each contact for the covered roadways. Although AAA's hourly cost was the lowest, because it had a lower contact rate, its cost per contact was higher than that of the cadets and RTTOs. On a per patrolled lane-mile basis, while the costs for the cadets and the RTTOs were equivalent in the Tacoma area, the cost of the RTTOs was still higher than that of the cadets in the Seattle area. These examples illustrate that a cost comparison among the different service modes can fluctuate depending on the intensity of the service coverage.

⁴ The negotiated contract hourly rate for the RTTOs includes their operator and vehicle costs, plus profit and overhead.

⁵ For WSP (per the agreement with WSDOT), the hourly vehicle cost is based on \$0.325 per mile, assuming an average roving speed of 30 mph (given congestion and stops for customer service contacts).

⁶ For WSDOT, the quoted value is for the "TEF(Transportation Equipment Fund) rental rate" for their tow vehicles, based upon 2000 hours of operation per year and replacement on an eight year truck life.

⁷ Cost estimate provided by AAA did not include a specific break out of labor and vehicle costs.

Table 4-4. Program Cost Breakdown by Contacts and Coverage Area

Agency	Est. Total Cost (8/00-1/01)	Total Contacts (8/00-1/01)	Lane Miles	Center Line Mile	Cost per Contact (8/00-1/01)	Cost per Patrolled Lane-Mile (8/00-1/01)
I-5 Seattle WSP Cadets	\$57,700	1459	27	9	\$40	\$2,100
I-5 Seattle RTTO	\$115,000	1231	21	7	\$93	\$5,500
I-90 & SR 520 Floating Bridges WSDOT Trucks	\$102,000	798	48	16	\$130	\$3,200
I-405 Seattle AAA RescueVan	\$27,500	300	66	22	\$92	\$400
SR 16 Tacoma WSP Cadets	\$28,900	767	22	11	\$38	\$4,300
I-5 Tacoma RTTO	\$57,500	764	33	11	\$75	\$4,300

CHAPTER 5 IMPLEMENTATION ISSUES

While no major problems interfered with the overall functions of the Service Patrol operations, institutional, operational, and technical issues did surface during the pilot project. Specific issues of importance are listed below. Each of these issues is discussed more fully below. Possible remedies are also presented when warranted.

<u>Institutional</u>	<u>Operational</u>	<u>Technical</u>
Program administration	Service hours	Radio equipment
Performance accountability	Fuel service	Magnetic Service Patrol signs
Retaining trained employees		

INSTITUTIONAL ISSUES

Program Administration

The Service Patrol pilot program was set up so that one maintenance supervisor in Seattle and one traffic engineer in Tacoma were responsible for the management of the contract as well as their original job tasks (i.e. employee evaluations, employee time, operational locations, etc.). WSDOT experienced major inconvenience with the constant change of tow companies in Tacoma. There, the RTTOs worked on a rotational basis, changing approximately every 45 days to accommodate six contracted tow truck companies. (In Seattle, the same two tow truck companies were contracted during the entire pilot period.) Thus, the training for the RTTOs became ongoing. Each training session only accommodated the operators from the upcoming one or two tow companies. Multiple training sessions were required because WSDOT determined that the training should take place soon before operation began so that all the new information (e.g., the

protocols for communicating with the dispatch center and the procedures for dealing with different types of contacts) would remain fresh in the operators' minds as they began their work. In Tacoma, about 30 percent of the WSDOT maintenance supervisor's time was needed to keep track of, train, and re-train the RTTOs, re-stock supplies, and process the paper work for the Service Patrol program. Possible solutions may include providing more funding dedicated to WSDOT's administrative role and lengthening each tow company's contract to avoid excess training and management associated with frequent rotation.

Performance Accountability

Program performance accountability was a significant issue among the Service Patrol providers operated by the cadets, RTTOs, and the AAA. No direct communication was available, nor was regular contact required with the operators. Especially with the RTTOs, no formal mechanism was provided during the pilot to ensure that the Service Patrols were, in fact, providing the intended service and that the staff providing that service were adequately trained for the job. While no direct evidence of problems was discovered in the pilot program evaluation, the program review indicated that stronger managerial control of the program would be beneficial. Such control may include mechanisms to ensure that Service Patrols are providing the intended service, that the staff providing that service are adequately trained for the job, and that contact with the public is courteous and professional.

Retaining Trained Employees

During the pilot project, a number of tow contractors had a hard time retaining trained employees for operations. This problem was due to the high personnel turnover rate in the towing business. The participating tow truck companies were not required to have a certain number of operators trained for the pilot program. Depending on the size of the company, the trained tow truck operators for the pilot program ranged from one to

five operators. As a result, tow companies asked for more frequent training courses to maintain sufficient numbers of properly trained personnel so they could still be qualified for the pilot program. This is another reason that the training was needed on an ongoing basis.

OPERATIONAL ISSUES

Service Hours

Concerns were raised about adjusting the service hours to appropriately capture the high volume areas during the peak commute hours. For the pilot, the hours for the Service Patrols operated by the WSP cadets and RTTOs were restricted to 6:00 AM to 10:00 AM and 2:00 PM to 6:00 PM, while the service hours for other roving patrols were slightly different, given the characteristics of the travel demand in each corridor. Although the service hours were not changed during the pilot period, participants realized that seasonal demand such as weather and school schedules could influence the need for service. For example, in the Tacoma area, operators found that it might be more suitable to shift the service hours to an earlier start (e.g., 5:30 AM to 9:30 AM) during the fall and winter months while schools were in session. Similarly, the service hours should accommodate the fact that people tend to stay out longer during the summer months, when schools are out and more recreational activities are available. The baseball games at Safeco Field in Seattle serve as a good example. During the weekdays, the games usually start at 7:00 PM. The volumes from regular commuters combined with people traveling to the game result in more congestion on I-5 and I-90 that lasts well beyond 6:00 PM. The service hours could also be modified because of the characteristics of travel demand in a corridor. For example, on the Ship Canal Bridge on I-5 in Seattle, the peak commute hours extend beyond the traditional morning and afternoon commute hours. Vehicle volumes typically stay relatively high (~1,500 vehicles per lane per hour) all day long, from 6:00 AM to 7:00 PM. Providing Service Patrols all day at this location

might be warranted. In summary, care should be taken to determine the appropriate hours for implementing the service, and flexibility should be allowed in implementing the program.

Fuel Service

The other major operational issue was whether the Service Patrol operated by the RTTOs should continue to supply free gasoline. Some RTTOs thought that the disabled vehicle should be towed to the nearest off-ramp or drop area (some gas stations are within walking distance), where motorists could make their own arrangements safely. RTTOs' reservations about carrying gasoline stemmed mainly from the cost of the gas and liability issues. First, fuel had become more costly (for the pilot project, the RTTOs were not reimbursed for fuel costs). They were also concerned about possible problems with private vehicles after the Service Patrol had given them fuel. Although most of the RTTOs' insurance companies preferred that they not carry extra gas, they did not prohibit the towers from providing fuel service. Last, refilling empty gas tanks takes time away from patrolling the roadways.

However, there are several reasons why the RTTOs should continue to supply free gasoline. First, out-of-gas vehicles appear to be a reasonably frequent (7 to 23 percent of service stops, depending on location, see Figure 3-10) cause of disabled vehicles on the freeway system. Second, despite the current cost of gasoline, the total cost of providing gasoline would be minor relative to the total cost of the program, only about \$1,200 per year. This figure is based on the actual number of assists related to refueling over the first 6 months of the pilot program and the costs associated with that service (see Table 5-1).

More importantly, supplying a small amount of gas to move those vehicles is likely to decrease the time required to remove the disabled vehicle. If fuel can get the disabled vehicle started, the motorist can drive directly to a gas station, and the Service

Patrol does not have to take the time to push or tow the vehicle. This provides both improved convenience and customer service. It also decreases the chances for vehicle damage to both the Service Patrol vehicle and disabled vehicle that could result from physical contact between the vehicles (whether by push bumper or tow hook). The pilot experience suggests that the time the Service Patrol takes to refill its gas can once it has given gas to a stranded motorist is not significant and can be reduced by carrying a larger gas can (a minimum capacity of 1 gallon was required by the pilot contract).

Because the cost of providing out-of-gas vehicles with free gasoline is relatively low, one solution may be for WSDOT to reimburse gasoline costs to the RTTO Service Patrol. And while no legal requirement is specifically available for carrying gas, it is understood that all portable gasoline must be stored in an approved container with an approved label and outside the vehicle.

Table 5-1. Fuel Service Demand

August/00- January/01)	Contacts with Fuel Problem	Daily Frequency (Assume 128 working days)	Fuel Consumption for Refueling Service (Assume 1–2 Gallon per Assist)	Fuel Cost (Assume \$1.70 per Gallon)
I-5 Seattle WSP Cadets	113	0.9	113 Gallons	\$192
I-5 Seattle RTTO	270	2.1	270 Gallons	\$459
Floating Bridges WSDOT	101	0.8	101 Gallons	\$172
I-405 Seattle AAA RescueVan	60	0.5	60 Gallons	\$102
I-5 Tacoma RTTO	54	0.4	54 Gallons	\$92
SR 16 Tacoma WSP Cadets	107	0.8	107 Gallons	\$182

TECHNICAL ISSUES

Radio Equipment

The Service Patrol communicated with the WSP's dispatch center over in-vehicle mobile radios supplied by the WSDOT. During the course of the pilot program, two of the radios provided by the WSDOT/WSP to the RTTO trucks in Tacoma failed and had to be replaced. The challenge was that the radios were old surplus equipment and were hard to purchase or to find replacement parts for. The WSDOT will not routinely replace the highband radios that the WSP is currently using for mobile communication because WSDOT only supports the new 800-mhz system. However, although the cost of the radios is high (approximately around \$4,000 each), WSDOT will need to continue using the highband system.

Magnetic Service Patrol Signs

The magnetic Service Patrol signs that were required on all on-duty Service Patrol vehicles did not always fit well and did not stay on. This is primarily because the RTTO trucks consisted of a range of vehicles, and thus no single sign size and shape fit all vehicles. As a result, signs were often lost and needed replacement. Alternatives to replacing the magnetic signs must satisfy three requirements: (1) they should not be affected by the different contours and designs of the vehicles, (2) they should not require a major retrofit, (3) they must clearly identify the Service Patrols and must be easily seen by the public. Alternatives may include flags or placards placed inside the vehicle window.

CHAPTER 6 CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

All tested modes of Service Patrol provided significant benefits in reducing incident response time, decreasing motorist delay, and increasing safety. The pilot project resulted in a variety of intangible benefits, such as improved interagency coordination and cooperation, more efficient utilization of personnel, and a better understanding of each partner's roles and contributions toward congestion relief. Over 90 percent of the assisted motorists who provided feedback for the evaluation rated the service as "excellent." The positive viewpoint toward the Service Patrol was uniform, regardless of the service mode. Many respondents suggested that the state increase the number of patrol vehicles and expand the geographic area covered by the patrols. Clearly, motorists see themselves benefiting directly from the tax dollars spent on this service.

While some of these benefits are quantifiable in this report, readers should be reminded not to draw unfair comparisons based on impressions that some services are more efficient than others. It is important to remember that the tested modes were assigned to roadways that have different characteristics, such as traffic demand and roadway configurations. In addition, because each service delivery provider had different vehicle choices and performed certain unique institutional duties and functions, the actual services provided varied slightly from one Service Patrol mode to another.

Washington State Patrol

The WSP service provided two significant benefits not offered by the RTTOs, WSDOT, or AAA. The first was that the WSP Service Patrol gave prospective WSP officers additional opportunity to train under real traffic conditions. It was also an excellent opportunity for WSP to review the job performance of cadets under realistic job

conditions. Second, a high level of interaction between WSP and WSDOT is always beneficial to both agencies, as increased levels of interaction and joint training result in more effective working arrangements between the field staff of these two agencies. Better working arrangements equate directly to more thorough achievement of both agencies' goals.

There were also two primary limitations to the WSP service. First, because of the WSP's vehicle choice, its patrols were not able to move a small fraction of disabled vehicles; however, the smaller size of the WSP Jeeps did allow them to maneuver more quickly through stopped traffic to reach an incident. Second, WSP participation in the Service Patrol program was limited by the number of cadets available for this program and the geographic distribution of those cadets.

Registered Tow Truck Operators

Under the pilot program, RTTO patrols were the most costly of the three modes. The RTTOs are still examining the true costs of participating in the program. The RTTO vehicles were tow equipped and carried extra gasoline. Because participation in the patrol effort was opened to all certified tow operators, there was considerable variation in the types of equipment used and the level of operator performance. Some RTTOs performed very well, while other operators had difficulty providing sufficient numbers of properly trained personnel.

One significant advantage of the RTTO service is that the equipment and personnel required to provide the services already exist. This means that patrol services can be provided on relatively short notice without increases in state staffing levels if such a need arises. This also means that short-duration (3 to 6 months) Service Patrol efforts could be operated anywhere within the state without the need for large capital expense outlays by WSDOT or WSP.

Washington State Department of Transportation

WSDOT Service Patrol staff were trained to perform other WSDOT maintenance and operations tasks, such as opening and closing Express Lane gates, clearing clogged catch basins, and performing traffic control. This allowed more flexible use of these staff to meet WSDOT needs. However, provision of additional service by WSDOT would require an increase in WSDOT staffing levels, as well as an increase in the WSDOT tow truck fleet.

American Automobile Association

The AAA RescueVan (and other approved, privately sponsored “motorist assistance” service providers) currently ranges over a wider service area. Since these efforts do not currently receive state funding, they do not concentrate on specific problem locations.

RECOMMENDATIONS FOR FUTURE IMPLEMENTATION

No significant changes to the existing pilot program are recommended at this time. All four Service Patrol efforts provided significant benefits that far outweighed the costs of the service provided. The largest benefits from Service Patrols will occur in areas of heavy congestion, particularly on congested roadways with geometric limitations (lack of shoulders or emergency pull-out areas). Current coverage was adequate, given the number of patrolling units per shift and the demand. The use of a combination of service providers has benefits that no single provider can duplicate, and the cost implications of changing the program are small enough that any potential savings would be fairly minor.

However, if the program is expanded, the evaluation team recommends that the expansion take advantage of the strengths of each provider while limiting each provider’s weaknesses. For instance, for roadways with no or limited shoulder space (e.g., SR 520), tow equipped vehicles are preferred for faster clearance capability. The WSP program

should remain limited in size and geographic scope to fit within the WSP's cadet training effort. RTTO involvement is most likely to be beneficial for areas where highly peaked traffic patterns warrant limited hours of service (and thus do not warrant the purchase of expensive tow vehicles specifically for Service Patrol needs), or if the size of state personnel rolls become an issue.

Extension of the program to other geographic areas is warranted. The largest benefits from Service Patrols will occur in areas of heavy congestion, particularly on congested roadways with geometric limitations (lack of shoulders or emergency pull-out areas). Potential areas for the extension of the Service Patrol program may include the nine zones initially identified in the January 14, 1998, report titled *Service Patrol Study – Greater Puget Sound Freeway System*:

- I-405: I-5 to SR 522 (King Co.)
- I-5: Nisqually River to the King County Line (Pierce Co.)
- I-5: South 272nd St. (King Co.) to South 164th St. (Snohomish Co.)
- I-90: I-5 to Eastgate (King Co.)
- SR 16: Olympic Village (Gig Harbor) to I-5 (Pierce Co.)
- SR 167: Pierce Co. line to I-405 (King Co.)
- SR 512: Pacific Avenue to I-5 (Pierce Co.)
- SR 518: SR 99 to I-405 (King Co.)
- SR 520: I-5 to SR 202 (King Co.)

Expansion is also likely warranted in areas outside of the nine zones. Careful engineering analysis is needed to determine in which locations the service would be most cost effective.

Public/private partnerships, such as an agreement with AAA or other potential service providers, are also worth pursuing in that private funding could significantly reduce the cost to the state of Service Patrol efforts. The ability of these “motorist assistance” vans to routinely report freeway traffic condition information to WSDOT's

management centers would be especially beneficial for high volume areas where camera coverage does not yet exist.

In all cases, some additional management controls should be considered to ensure that maximum benefit is obtained from the funded services. For example, GPS vehicle tracking devices could be required in all Service Patrol vehicles to verify that the intended services were being provided.

The public is generally uninformed about the program. When motorists do learn about the program, public sentiment is overwhelmingly in favor of it. Better advertising of the program would boost public support and would gain favorable attention to the Legislature's attempts to provide congestion relief.

Last, the data collection and recording process should be improved and a single, uniform database should be maintained for ongoing monitoring and future evaluation of Service Patrol activities. One option may be to use handheld devices to record data and download the information directly to a single database for future use.

**APPENDIX A
PROJECT PARTNERS CONTACT LIST**

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APPENDIX B
INFORMATION BROCHURE ON SERVICE PATROLS



LOOK FAMILIAR?

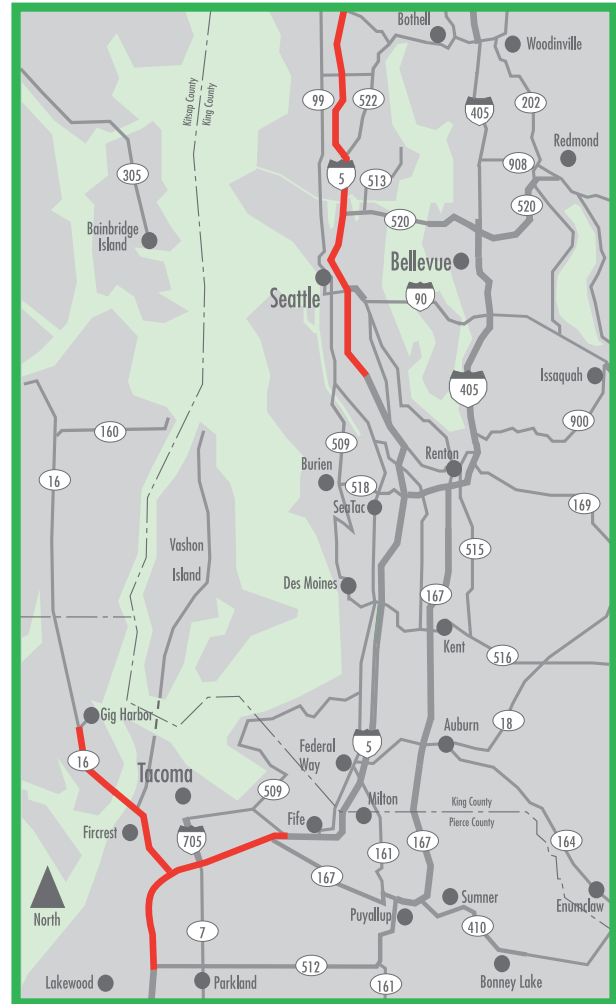
This back-up might have been caused by a major incident - or something as small as a flat tire. Nearly 60 percent of the congestion on our highways is caused by vehicle collisions or blocking incidents.

Now there is another service out there to help keep traffic moving. It's called the Service Patrol. Washington State Patrol (WSP) cadets and roving tow trucks will provide rapid assistance to motorists by patrolling key highway segments during peak commute hours. They will move disabled vehicles and their occupants to safe locations, remove debris from the roadway, and resolve other problems (i.e., providing a jump start or helping with a tire change). Once a vehicle is at a safe location clear of the roadway, motorists have the option to request a tow - at their expense - or make their own arrangements for removal of their vehicle.

The Service Patrol is another effort by the Washington State Department of Transportation (WSDOT), WSP, and the Washington Tow Truck Association, which demonstrates our commitment to finding new ways to reduce traffic delays.



Watch for the Service Patrol logo.



Roving tow trucks will patrol during peak commute hours Monday through Friday in Seattle on I-5 between Corson-Michigan Street and Mercer Street, and in Tacoma on I-5 between 38th Street and the Port of Tacoma Road in the morning, and between the SR 16 Interchange and SR 512 Interchange in the afternoon.

WSP cadets will patrol during peak commute hours Monday through Friday north and southbound I-5 in Seattle from Roanoke Street to 130th Street, including all ramps, the Express Lanes, and collector distributors. They will also patrol west and eastbound SR 16, from I-5 to 24th Street, including all ramps and collector distributors.

OTHER WAYS WE'RE KEEPING TRAFFIC MOVING

WSDOT Incident Response Teams provide 24-hour, on-call support to the WSP for major road-blocking incidents.

WSDOT Tow Truck Patrols are on the Lake Washington floating bridges (I-90 and SR 520) during peak commute times.

WSDOT on-line freeway cameras and traffic flow maps help you view your route and plan your travel in advance.

www.wsdot.wa.gov

APPENDIX C
SERVICE PATROL ASSIST FORM AND SURVEY

WSDOT Service Patrol Assist Form

Your Name	Agency/Company	Month	Day	Year

Location of Disabled Vehicle:

Hwy	Lane Type	Lane Number	
Direction	<input type="checkbox"/> Mainline <input type="checkbox"/> On-ramp	<input type="checkbox"/> Right Shoulder	<input type="checkbox"/> Lane 4
	<input type="checkbox"/> HOV <input type="checkbox"/> Exit-ramp	<input type="checkbox"/> Lane 1	<input type="checkbox"/> Lane 5
MP/St	<input type="checkbox"/> Collector Distributor	<input type="checkbox"/> Lane 2	<input type="checkbox"/> Left Shoulder
	<input type="checkbox"/> Express Lane	<input type="checkbox"/> Lane 3	

Time logs for your response:

Detection/Notification	
<input type="checkbox"/> Subject was found by you	Time you detected or being notified _____
<input type="checkbox"/> Information broadcast by WSP	Time you arrived at the scene _____
<input type="checkbox"/> Other: _____	Time road cleared, vehicle out of travel lane _____
	Time you departed from the assisted vehicle _____

Check all that apply:

Cause	Problem	
<input type="checkbox"/> Disabled <input type="checkbox"/> Accident <input type="checkbox"/> Injury Accident <input type="checkbox"/> Debris <input type="checkbox"/> Pedestrian <input type="checkbox"/> Fire <input type="checkbox"/> UTL <input type="checkbox"/> Other: _____	<input type="checkbox"/> Fuel <input type="checkbox"/> Tire <input type="checkbox"/> Mechanical <input type="checkbox"/> Overheat <input type="checkbox"/> Electrical <input type="checkbox"/> Abandoned <input type="checkbox"/> Blocking <input type="checkbox"/> Other: _____	<input type="checkbox"/> Push: a) <input type="checkbox"/> off fwy, _____ ; b) <input type="checkbox"/> to shoulder <input type="checkbox"/> Tow: a) <input type="checkbox"/> off fwy, _____ ; b) <input type="checkbox"/> to shoulder <input type="checkbox"/> Assist <input type="checkbox"/> Clear off <input type="checkbox"/> Transport <input type="checkbox"/> Call additional tow service a) <input type="checkbox"/> rotation tow; b) <input type="checkbox"/> owner requested (tow name _____) <input type="checkbox"/> Call for assist a) <input type="checkbox"/> WSP; b) <input type="checkbox"/> Fire; c) <input type="checkbox"/> EMT; d) <input type="checkbox"/> Other: _____ <input type="checkbox"/> Photos taken <input type="checkbox"/> Other: _____

Description of disabled vehicle:

	License No.	State	Color	Make	Model
Vehicle I					
Vehicle II					

WSDOT Service Patrol Survey



Dear Motorist: Assistance from this WSDOT Service Patrol is provided to you free of charge by the Washington State Department of Transportation. It is designed to reduce traffic congestion during your daily commute. To help us improve the service, please take a moment to answer these survey questions and mail the form back. No postage is necessary.

No gratuities or payments will be accepted by WSDOT Service Patrol drivers. In addition, they cannot recommend secondary tow operators.

- How did the WSDOT Service Patrol know you needed assistance?**
 - 1 Another driver saw me 2 Used a call box 3 State Patrol assistance
 - 4 Other: _____
- How long did you wait for Service Patrol assistance?**
 - 1 Less than 5 minutes 2 5-10 minutes 3 10-20 minutes
 - 4 20-30 minutes 5 30-40 minutes 6 Longer
- If the Service Patrol moved your car to a safe area, how long did you wait for additional help?**
 - 1 Less than 15 minutes 2 15-30 minutes 3 30-45 minutes
 - 4 45-60 minutes 5 60-90 minutes 6 Longer
 - 7 No more help is needed
- If you needed a secondary tow, what company did you choose and why?**

- What was the Service Patrol driver's attitude toward you while providing assistance?**

- Overall, how would you rate the service?**
 - 1 Excellent 2 Good 3 Fair 4 Poor 5 Other
- How did you know about the Service Patrol Program?**
 - 1 Newspaper 2 Radio 3 TV
 - 4 Brochure 5 Friend 6 Billboard
 - 7 Other _____ 8 Did know until today
- How would you improve the WSDOT Service Patrol program?**

For more information regarding the WSDOT Service Patrol, please call: (206) 726-6752



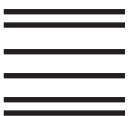
Assist Form and Survey

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**Washington State
Department of Transportation**
 Incident Response Manager
 811 E Roanoke St
 Seattle WA 98102-9961



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